SOUTH FLORIDA WATER MANAGEMENT DISTRICT

FIVE-YEAR WATER RESOURCE DEVELOPMENT WORK PROGRAM

FISCAL YEARS 2004-2008

sfwmd.gov

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Five-Year Water Resource Development Work Program

Fiscal Years
2004 – 2008

March 2004

Water Supply Department
South Florida Water Management District

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This document provides a description of the projected five-year work program for developing water resources by the SFWMD. Cost and labor projections are provided for Fiscal Year (FY) 2004 through FY 2008, and represent the outlook as of FY 2004 budget adoption. Water supply plan recommendation implementation updates for previous years are also provided.

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LIST OF ACRONYMS AND ABBREVIATIONS

ASR	aquifer storage and recovery
AWS	alternative water supply
BOR	Basis of Review
CERP	Comprehensive Everglades Restoration Plan
CREW	Corkscrew Regional Ecosystem Watershed
CUP	consumptive use permitting
DWMP	District Water Management Plan
EAA	Everglades Agricultural Area
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FPL	Florida Power & Light
FTEs	full-time equivalents
F.S.	Florida Statutes
FY	fiscal year
IAS	Intermediate Aquifer System
KB	Kissimmee Basin
KB Plan	Kissimmee Basin Water Supply Plan
LEC	Lower East Coast
LEC Interim Plan	Interim Plan for Lower East Coast Regional Water Supply
LEC Plan	Lower East Coast Regional Water Supply Plan
LWC	Lower West Coast
LWC Plan	Lower West Coast Water Supply Plan
MFLs	minimum flows and levels
MGD	million gallons per day
MGY	million gallons per year
Miami-Dade WASD	Miami-Dade Water and Sewer Department

MIL	mobile irrigation lab
NRCS	National Resources Conservation Service
PIR	Project Implementation Report
PMP	Programmatic Management Plan
PPDR	Pilot Project Design Report
RECOVER	Restoration Coordination and Verification
Restudy	Central and Southern Florida Project Comprehensive Review Study
RIDS	Regional Irrigation Distribution System
RWSP	regional water supply plan
RO	Reverse Osmosis
SAS	Surficial Aquifer System
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
SWFWMD	Southwest Florida Water Management District
TBD	to be determined
UEC	Upper East Coast
UEC Plan	Upper East Coast Water Supply Plan
UIC	underground injection control
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WCA	Water Conservation Area
WPA	Water Preserve Area
WRAC	Water Resources Advisory Commission
WRDA 2000	Water Resource Development Act of 2000
WSE	water supply and environmental

INTRODUCTION

Section 373.536(6)(a)4, Florida Statutes (F.S.) requires each water management district to prepare a five-year water resource development work program. This is the fifth such work program produced by the South Florida Water Management District (SFWMD or District). The initial work program document was prepared by the SFWMD in 1999 with updates each year since 2000 (SFWMD, 1999, 2000a, 2002a, 2003). The dollar amounts and full-time equivalents (FTEs) presented in this document represent the best estimates of resource allocation during implementation of the regional water supply plans from FY 2004 through FY 2008. These dollars and FTEs are subject to change as water managers reassess SFWMD's needs and priorities during the annual budget process. All four regional water supply plans are scheduled to be updated by 2005, so changes are anticipated in existing recommendations and corresponding changes in proposed funding after 2005.

This document also includes summaries and updates on the implementation of recommendations made in the regional water supply plans.

The *Upper East Coast (UEC) Water Supply Plan* (SFWMD, 1998a) was the SFWMD's first plan completed under the 1997 legislative modifications to Chapter 373, F.S., discussed in the Legal Basis of Water Supply Planning section of this document. The SFWMD's Governing Board approved the UEC Water Supply Plan in February 1998. In April 2000, the Governing Board approved regional water supply plans for the Kissimmee Basin (KB) and the Lower West Coast (LWC) (SFWMD, 2000b, 2000c). The *Lower East Coast (LEC) Regional Water Supply Plan* (SFWMD, 2000d) was approved in May 2000. Each plan was formulated to reflect the particular needs of its respective planning area within the SFWMD (**Figure 1**). District staff and advisory committees composed of local, state and federal agency staff and representatives from urban, agricultural and environmental interests in each area developed the recommendations in each plan. This report describes the time frames and costs projected to implement each plan.

Document Organization

As in previous Five-Year Water Resource Development Programs, water resource development projects recommended by regional water supply plans are discussed in sections that describe Districtwide efforts, as well as in area specific sections, as appropriate. Many Districtwide activities are also discussed in the planning area sections, but the associated costs are included in the Districtwide section total, not the planning area totals.

Because each planning area has unique characteristics, the regional water supply plans were each structured differently. In this document, the discussions of water resource development recommendations and projects for a particular planning area are organized as they were in each respective plan. The KB section is organized based on strategies and associated water resource development recommendations, with three strategies for the Orange-Osceola County area and two for the Lake Istokpoga-Indian Prairie Basin. The UEC and LWC sections are organized based on source options.

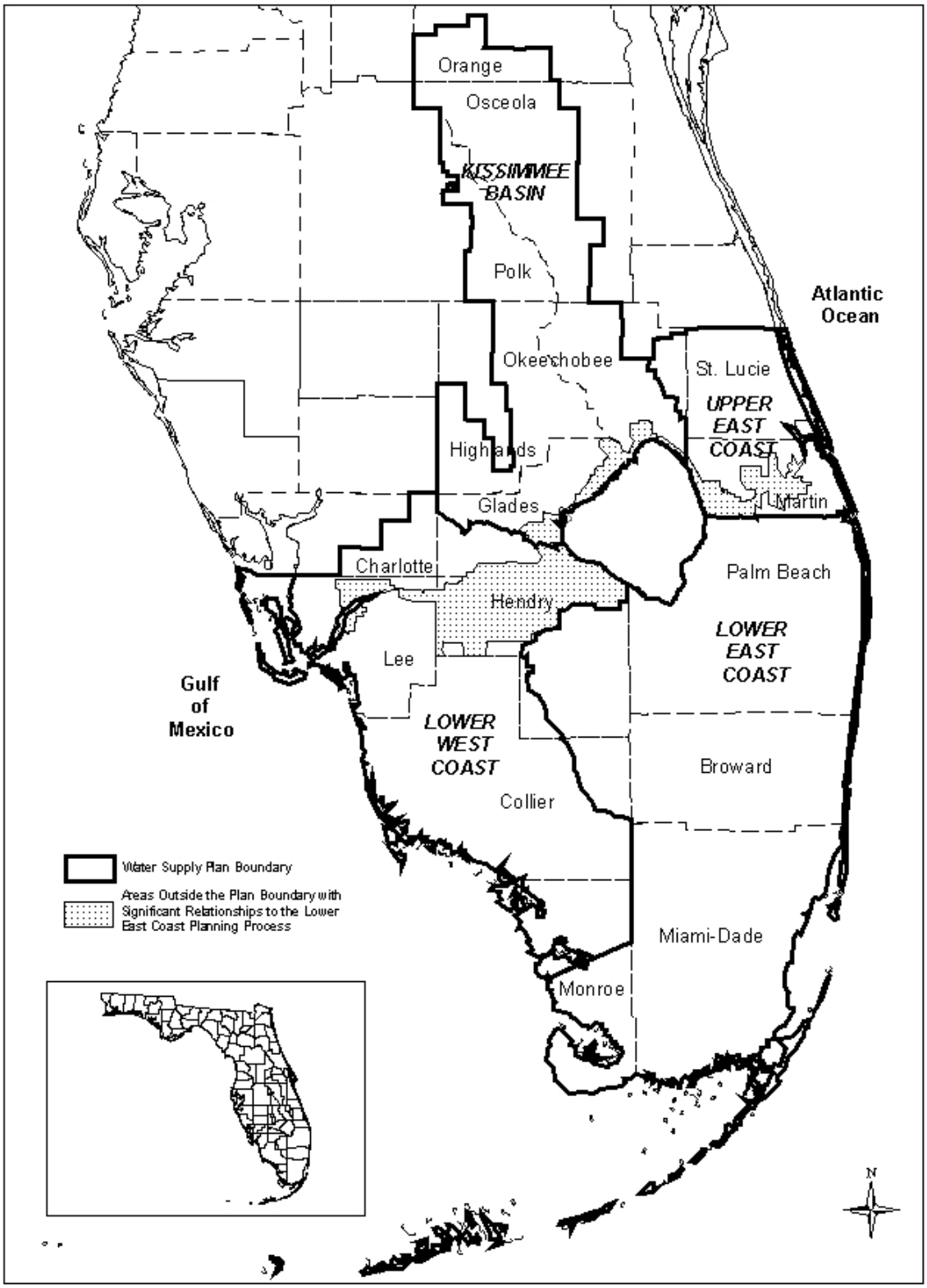

Figure 1. Water Supply Planning Areas within the SFWMD

Water resource development recommendations in the LEC section are grouped by the scope, nature and funding sources of the proposed projects.

Each category of recommendations provides a description and general listing of water resource development projects and activities. Costs to the SFWMD including estimates of total District staff time required in Full Time Equivalents (FTEs) and a funding schedule by fiscal year (FY) are presented in a table at the end of each water supply plan section. One FTE represents 40 hours per week of work effort by one person for a period of 52 weeks. Estimates of the total amounts of water provided by the recommendations, along with funding sources and implementing agencies are provided (to the extent that these can be determined) at the end of each water supply plan section. Water resource development categories and projects are numbered to correspond with the numbered categories and recommendations in each regional water supply plan document. Recommendations from the *Caloosahatchee Water Management Plan* (SFWMD, 2000e) are listed in the LWC section.

A summary of the SFWMD's projected funding needs is provided in the Funding Needs section of this document. Total costs are presented for both the five-year period from FY 2004 through FY 2008 and for the current fiscal year (FY 2004).

Time Frames and Total Costs

The time frames for this Five-Year Water Resource Development Program are from the SFWMD's fiscal years beginning October 1, 2003 and ending September 30, 2008. Total costs for this period for all the recommendations or strategies for each individual plan can be found in a table at the end of each section. Many of the Comprehensive Everglades Restoration Plan (CERP) projects and two other activities (water conservation and assessment of the effects of water level drawdowns on wetlands) span the boundaries of multiple planning areas. These projects are discussed in the Districtwide Water Resource Development Efforts section of this document.

In some cases, actual costs shown in this document for FY 2004 year may differ from the published cost figures in the regional water supply plans. The differences between plan numbers and those in this report can be attributed to the refinement of the planning and development level costs during the budget process, and to the identification of cost-share partners. The costs presented in this work program document are consistent with the FY 2004 approved budget.

LEGAL BASIS OF WATER SUPPLY PLANNING AND DEVELOPMENT

The Florida Legislature authorizes the SFWMD to manage water use in south Florida. One important task in this charge is planning to meet future water demands. In partial fulfillment of this requirement, the SFWMD has prepared regional water supply plans. Water supply planning and development activities were first required of the state's water management districts following adoption of the Florida Water Resources Act of 1972 (Chapter 373, F.S.). During the 1997 legislative session, significant amendments were made to the Water Resources Act. The amendments clarified agency responsibilities related to regional water supply planning and development and included the provisions of the Governor's Executive Order 96-297. The amendments provided direction to Florida's water management districts in the establishment and implementation of minimum flows and levels (MFLs) and the development of regional water supply plans where sources are not adequate to meet future demands.

The SFWMD has undertaken a water supply planning and development initiative to ensure prudent management of south Florida's water resources. The SFWMD has committed to an overall water resources goal. This goal is derived from the State Comprehensive Plan, Section 187.201(7)a, F.S., which states:

> Florida shall assure the availability of an adequate supply of water for all competing uses deemed reasonable and beneficial and shall maintain the functions of natural systems and the overall present level of surface and groundwater quality. Florida shall improve and restore the quality of waters not presently meeting water quality standards.

Statutory mandates for planning and development by the water management districts, in cooperation with the Florida Department of Environmental Protection (FDEP), are found in several sections of Chapter 373, F.S. One of these sections, 373.036(1), F.S., requires the FDEP to develop the Florida Water Plan in cooperation with the water management districts, regional water supply authorities and others. The Florida Water Plan includes, but is not limited to, the following items:

- The programs and activities of the FDEP related to water supply, water quality, flood protection and floodplain management and natural systems
- The water quality standards of the FDEP
- The district water management plans
- Goals, objectives and guidance for the development and review of programs, rules and plans relating to water resources, based on statutory policies and directives [the State Water Policy, renamed the Water Resource Implementation Rule pursuant to Section 373.019(20), F.S., shall serve as this part of the plan (Chapter 62-40, F.A.C.)]

Regional water supply planning and development is mandated under Section 373.0361(1), F.S. This statute provides, in part, the following:

> By October 1, 1998, the governing board shall initiate water supply planning for each water supply planning region identified in the district water management plan under Section 373.036, where it determines that sources of water are not adequate for the planning period to supply water for all existing and projected reasonable-beneficial uses and to sustain the water resources and related natural systems.

Each regional water supply plan shall be based on at least a 20-year planning and development period and shall include, but not be limited to the following components:

- A water supply development component
- A water resource development component
- A recovery and prevention strategy for addressing attainment and maintenance of MFLs in priority water bodies
- A funding strategy for water resource development projects that shall be reasonable and sufficient to pay the cost of constructing or implementing all of the listed projects
- Consideration of how the options addressed serve the public interest or save costs overall by preventing the loss of natural resources or avoiding greater future public expenditures for water resource development or water supply development (unless adopted by rule, these considerations do not constitute final agency action)
- The technical data and information applicable to the planning area that are contained in the *District Water Management Plan* (DWMP) (SFWMD, 2000f) and necessary to support the regional water supply plans
- The MFLs established for water resources within the planning area

Under Section 373.0361(5), F.S., the FDEP is mandated to submit an annual report on the status of regional water supply planning and development in each district to the Governor and the legislature. The report is to contain a compilation of the estimated costs and potential sources of funding for water resource development and water supply development projects, as identified in the water management district regional water supply plans. The report must also contain a description of each district's progress toward achieving its water resource development objectives, including progress toward completion of a five-year water resource development work program.

Section 373.536(6)(a)4, F.S., mandates the preparation of a proposed five-year water resource development work program by each water management district. The work program must describe each district's implementation strategy for the water resource development component of each approved regional water supply plan developed or revised pursuant to Section 373.0361, F.S. The work program is required to address all elements of the water resource development components in each district's approved regional water supply plans.

STATUTORY DEFINITION OF WATER RESOURCE DEVELOPMENT AND WATER SUPPLY DEVELOPMENT

The regional water supply plans recommended the implementation of projects and actions from two categories: water resource development projects and water supply development options. This is in concert with amendments to Chapter 373, F.S. that were passed in 1997. These changes require regional water supply plans to include a water resource development component and a list of water source options for water supply development that can be chosen by local water users. The statute defines water resource development and water supply development as follows:

> 'Water resource development' means the formulation and implementation of regional water resource management strategies, including the collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage water resources; the development of regional water resource implementation programs; the construction, operation and maintenance of major public works facilities to provide for flood control, surface and underground water storage and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately owned water utilities.
>
> 'Water supply development' means the planning, design, construction, operation and maintenance of public or private facilities for water collection, production, treatment, transmission or distribution for sale, resale or end use.

In addition to the legislative definitions described above, the designation of a component as a water resource development project was based on it having the following characteristics:

- Has the opportunity to address more than one resource issue
- Addresses a variety of use classes (e.g., environment, public water supply)
- Protects/enhances resources available for allocation
- Moves water from water surplus areas to water deficit areas
- Has a broad application of technology

The equivalent characteristics that led to designations of projects as water supply development options are as follows:

- Requires localized implementation of technology
- Delivers resources to consumers
- Has regionalized interconnects to consumers

The SFWMD is primarily responsible for the implementation of the water resource development components including projects making additional quantities of water available, as well as projects having other direct objectives. Local users have primary responsibility for water supply development by choosing the water source options that will best meet their needs.

INFORMATIONAL UPDATE ON RECOMMENDATIONS AND PROJECTS IDENTIFIED IN REGIONAL WATER SUPPLY PLANS

The following sections provide summaries of the results of each of the water supply planning and development efforts in the SFWMD. Districtwide efforts are presented first, followed by the planning area efforts. The planning area information is presented from north to south, beginning with the Kissimmee Basin.

Districtwide Water Resource Development Efforts

Districtwide programs include the Wetland Drawdown Study, the Comprehensive Water Conservation Program, Mobile Irrigation Labs (MILs), Critical Projects and the CERP. Some water supply plans include recommendations for these programs, but budgeting and funding for these programs is being done on a Districtwide basis. The MILs are part of the Comprehensive Water Conservation Program; however, and cost projections have been presented separately in this document. Similarly the Critical Projects are part of the CERP, but numbers are presented separately. The Wetland Drawdown Study has been completed. The schedule and costs to implement the Comprehensive Water Conservation Program and the MILs over the next five fiscal years are summarized in **Table 1**. The Critical Projects are listed in **Table 2**. The CERP schedule and costs are listed in **Table 3**.

Wetland Drawdown Study

The Wetland Drawdown Study has been completed and a rule implementing the findings of the study is in effect. The SFWMD presented revisions to the Basis of Review (BOR) for Water Use Applications to the Governing Board in June of 2003. The Governing Board approved staff's recommendation for adoption of the rule. The rule became effective in September 2003. Section 3.3 of the BOR establishes the criteria for the protection of wetlands from harm caused by consumptive use withdrawals of water. Staff in the Water Use Division is now implementing the new wetland protection criteria.

The SFWMD has initiated numerous rulemaking efforts consistent with the regional water supply plans. A discussion of consumptive use permitting, rulemaking and resource protection projects is located in the 2000 LEC Water Supply Plan, Water Resource Development Options section of this document.

Comprehensive Water Conservation Program

One of the most significant Districtwide projects is the development of the Comprehensive Water Conservation Program. The SFWMD expanded its water conservation efforts in 2002 by redirecting staff to a Water Conservation Section within the Water Supply Department. Some tasks included in the scope of the Water Conservation Section are: utility

technical assistance, alternative water supply funding, water conservation incentive cooperative funding, water reuse project management, expanding awareness of Xeriscape™ landscape principles, mobile irrigation laboratory management for urban and agricultural irrigators, water use permit review coordination for water conservation requirements, revisions to SFWMD's conservation rules (40E-2, 40E-21, 40E-24) and active participation in the statewide water conservation initiative. In addition, the scope of the expanded conservation program is aimed at working with and supporting the activities of water utilities, major water user groups, industry and local governments to achieve demand rate reductions for each type of use. During the next five years, the SFWMD is planning to spend $3.9 million and 32.50 FTEs to implement the Comprehensive Water Conservation Program (**Table 1**); additional expenditures are shown for MILs.

Below are some of the activities that illustrate the progress of the Comprehensive Water Conservation Program during fiscal year 2003:

- Provided 34 Alternative Water Supply grants of over $4 million to public and private partners, leveraging funding on capital improvement projects totaling $102 million, which will create 101.7 million gallons per day of non-conventional water supply.
- Provided 8 demand management grants to local governments totaling $250,000; these projects are non-capital and use water efficient technologies, such as low flow shower heads for hotels. When complete, these projects will reduce water demand by 171 million gallons per year (MGY).
- Initiated water reuse studies on both the east and west coasts of the SFWMD for regional reuse distribution systems.
- Continued Districtwide outreach and education campaigns.
- Continued operation of MILs in ten SFWMD counties.
- Developed two rules: 1) water shortage and 2) basis of review for water use.
- Adopted and implemented Lower West Coast year-round landscape irrigation measures, Rule (40E-24) for Lee, Collier and portions of Charlotte Counties.
- Continued active participation in the Statewide Water Conservation Initiative.
- Provided guidance and assistance for local governments and utilities in establishing comprehensive water conservation programs.
- Planned and coordinated National AWWA Water Conservation workshops in Ft. Lauderdale (February 2003).
- Expanded the MIL program to include a new urban lab in Broward County, which will be a partnership between the SFWMD, U.S. Department of Agriculture-National Resources Conservation Service

(USDA-NRCS) and Broward Soil and Water Conservation District working with Broward County Cooperative Extension Service to identify opportunities to increase landscape irrigation water use efficiency.

For FY 2004 through FY 2008, the Water Supply Department staff plans the following activities:

- Assist SFWMD planners in updating the DWMP and regional water supply plans
- Assist SFWMD planners in updating and enhancing funding partnerships with local water users and utilities
- Encourage and fund alternative water supply development projects and reuse systems
- Continue water conservation education in the Lower West Coast region to support the year-round conservation Rule 40E-24
- Assist local governments, water utilities, the FDEP, the Florida Public Service Commission and the industry in the implementation of the Statewide Water Conservation Initiative, and adoption of comprehensive water conservation-based rules and initiatives consistent with Statewide Initiative recommendations
- Provide technical assistance by reviewing water use characteristics of large water users and suppliers in establishing successful conservation programs and projects designed for specific service areas and consumer needs
- Continue providing support to develop comprehensive water conservation standards for voluntary use by water utilities

Mobile Irrigation Labs (MILs). Cost-share funding has been provided for the maintenance and establishment of MILs. These irrigation evaluation services have become an important component in the SFWMD's Comprehensive Water Conservation Program. The SFWMD currently funds nine MILs, including one funded through the Big Cypress Basin. In addition, since 1992 the USDA-NRCS has fully funded an agricultural lab that serves Martin, St. Lucie and Okeechobee Counties. Each MIL completes 110 to 140 evaluations per year and provides irrigation system operators with conservation schedules and operational guidance. Potential benefits of these labs (urban and agricultural) include combined water savings of approximately 3,300 million gallons of water per year, as well as an associated reduction in chemical and fertilizer use and runoff. Broward, Collier, Lee, Hendry, Miami-Dade, Palm Beach, Martin, St. Lucie, Glades, Charlotte and Okeechobee Counties participate in the Districtwide MIL Program. During the next five years, the SFWMD anticipates spending $3.0 million and 2.5 FTEs on the MILs, in addition to the $3.9 million and 32.50 FTEs for the rest of the Comprehensive Water Conservation Program (**Table 1**). In 2004, the SFWMD will spend $7,500 on the purchase of irrigation evaluations in Osceola County as part of a comparison study of audit methods. In 2005, the SFWMD plans to start a MIL in Orange County.

Water Conservation Efficiency Goals. To date the SFWMD has primarily used utility per capita rates for the purpose of demand projection and has based these rates on raw

water withdrawal and permanent resident population. While effective as a projection tool, permanent resident raw water per capita has its limitations in evaluating utility use rates in areas with disparate seasonal and tourist population proportions. The SFWMD has been participating in two activities to increase information to further standardize data collection and water use efficiency with utilities and water management districts. First, the SFWMD is participating in the Statewide Water Conservation Initiative to standardize water use evaluation methods and develop a work plan to put these methods into place. Secondly, the water management districts are participating in a statewide study of customer response to water rate tiers. The information resulting from the study can be used by utilities to determine the most efficient rates for their customer base.

Water Conservation Plans for Regional Water Supply Plans. The SFWMD has a water conservation element in each of the four regional water supply plans. Included in this element are recommendations reflecting the Water Conservation Programs for MILs and cooperative funding for hardware or technology-oriented demand management projects (such as rain switch retrofits, pressure regulation and detection of unbilled water loss). The recommendations reflect the specific conservation and alternative water supply needs of the regions. Reuse projects and other alternative water supply projects have been funded Districtwide.

Table 1. Funding for Districtwide, non-CERP Efforts FY 2004 – FY 2008.

Comprehensive Districtwide Water Resource Development Efforts	Districtwide Implementation Costs ($1,000s and FTEs)											
	FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–FY 2008	
	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Conduct Wetland Drawdown Study	Complete											
Develop Comprehensive Water Conservation Program	750	6.50	900	6.50	750	6.50	750	6.50	750	6.50	3,900	32.50
Provide Cost-share Funding for Mobile Irrigation Labs	564	0.50	621	0.50	621	0.50	621	0.50	621	0.50	3,048	2.50
TOTAL	**1314**	**7.00**	**1521**	**7.00**	**1371**	**7.00**	**1371**	**7.00**	**1371**	**7.00**	**6,948**	**35.00**

Comprehensive Everglades Restoration Plan (CERP)

The SFWMD is the nonfederal sponsor of a vast environmental restoration project that is an overhaul of the Central and Southern Florida Project. Although the CERP is an environmental restoration plan, some projects within the CERP have water resource development benefits. The United States Army Corps of Engineers (USACE) built the original project in the 1950s and 1960s (USACE and SFWMD, 1999). The CERP itself is a 38-year effort with elements in all four planning areas. Most of these elements are scheduled for completion by 2020. Area specific CERP elements are addressed in respective regional water supply plans, but for the purposes of this document, are discussed as Districtwide projects.

Included in the CERP are several Critical Projects that were authorized by Section 528 of the Water Resource Development Act of 1996. The purpose of the Critical Project

Program was to develop specific water quality related projects that are essential to the restoration of south Florida's natural systems. While these projects are part of the CERP, they are listed separately in **Table 2**.

Table 2. Nonfederal Funding for Critical Projects FY 2004 – FY 2008

Critical Projects	Districtwide Implementation Costs ($1,000s)					
	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	Total Cost FY 2004 - FY 2008
	$	$	$	$	$	$
Ten Mile Creek Critical Project	3,288	5,573	3,428	Complete		12,289
Tamiami Trail Culverts (West) Critical Project	6,157	10,171	6,020	Complete		22,348
Western C-4 Structure Critical Project	0	Complete				0
Southern CREW Project Addition	1,789	0	Complete			1,789
Lake Trafford Restoration	6,769	10,000	10,000	48	Complete	26,817
Lake Okeechobee Water Retention/Phosphorus Removal	705	1,100	0	Complete		1,805
Western C-11 (S-9) Water Quality	1,900	1,507	0	Complete		3,407
Critical Restoration Program Controls	27	00	0	Complete		27
TOTAL	**20,635**	**28,351**	**19,448**	**48**	**0**	**68,482**

The remaining CERP components that have projected activity (funds or FTEs expended) in the FY 2004 through FY 2008 time period are shown in **Table 3**. The tables include the SFWMD cost of each element, with the understanding that the CERP is a 50-50 cost share with the USACE. Tables include the nonfederal share of projects' costs with the understanding that there may be local cost sharing for certain projects. More detailed information about each element is available from several sources. Element descriptions are available in the *Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement* (USACE and SFWMD, 1999), referred to as the Restudy and the *Master Program Management Plan* (USACE and SFWMD, 2000). Current project descriptions and implementation status information is maintained on the CERP website available from: http://www.evergladesplan.org.

Table 3. Nonfederal Funding for CERP Projects FY 2004 – FY 2008

Project Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	Total FY 2004–FY 2008
Districtwide						
ASR Regional Study	2,315,338	1,589,574	1,573,864	1,581,751	1,218,118	8,278,645
Reconnaissance, Feasibility, Planning Studies	3,231,729	264,600	0	0	0	3,496,329
Monitoring, Evaluation (RECOVER)	7,248,894	5,000,000	5,000,000	5,000,000	5,000,000	27,248,894
CERP Program Management, Support	31,778,750	14,285,657	15,310,914	14,824,500	14,561,250	90,761,071
Kissimmee Basin						
Lake Okeechobee Watershed	5,392,253	1,467,689	13,594,137	75,956,018	76,385,630	172,795,727
Lake Istokpoga Regulation Schedule	0	0	0	0	0	0
Lake Okeechobee ASR Pilot	1,498,554	16,901	761,578	854,202	408,403	3,539,638
Upper East Coast						
Indian River Lagoon-South	107,484,765	70,945,840	67,118,017	64,809,432	59,493,277	369,851,331
Lower West Coast						
C-43 Basin Storage Reservoir-Part 1	8,545,650	44,755,020	44,529,072	27,493,020	0	125,322,762
Caloosahatchee Backpumping with Stormwater Treatment	0	0	0	0	0	0
Big Cypress/L-28 Interceptor Modifications	0	0	0	0	0	0
Southern Golden Gates Estates Hydrologic Restoration	14,737,807	138,636	0	0	0	14,876,443
Caloosahatchee (C-43) River ASR Pilot	1,327,349	106,833	44,492	15,000	12,396	1,506,070
Lower East Coast						
Everglades Agricultural Areas Storage Reservoirs-Phase 1	810,256	1,598,809	12,360	5,659	0	2,427,084
Everglades Agricultural Areas Storage Reservoirs-Phase 2	0	0	0	0	0	0
WCA 3 Decomp & Sheet Flow Enhancement-Part 1	1,699,695	225,209	287,762	336,982	197,718	2,747,366
WCA 3 Decomp & Sheet Flow Enhancement-Part 2	0	0	0	0	0	0
Loxahatchee National Wildlife Refuge Internal Canal Structures	9,144	0	0	0	0	9,144
Modify Holey Land Wildlife Management Area Operation Plan	0	0	0	0	0	0
Modify Rotenberger Wildlife Management Area Operation Plan	0	0	0	0	0	0
No. Palm Beach County-Part 1	42,121,847	36,101,299	24,396,674	37,984,486	40,200,000	180,804,306
PBC Agriculture Reserve Reservoir-Part 1	29,085	0	200,432	149,500	5,098,180	5,477,197
Broward County Secondary Canal System	161,402	832,311	598,341	0	0	1,592,054
Everglades National Park Seepage Management	0	0	0	0	0	0
Biscayne Bay Coastal Wetlands	25,622,577	0	229,452	330,251	332,904	26,515,184
C-111 Spreader Canal	706,500	263,500	200,000	200,000	1,923,532	3,293,532
Florida Keys Tidal Restoration	283,667	33,941	14,679	0	0	332,287
Hillsboro ASR Pilot	276,976	196,658	195,871	198,113	21,799	889,417
Lake Belt In-Ground Reservoir Technology Pilot	373,753	674,175	1,486,085	847,850	13,753	3,395,616

Table 3. Nonfederal Funding for CERP Projects FY 2004– FY 2008 (Continued)

Project Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	Total FY 2004–FY 2008
Lower East Coast (Continued)						
L-31N Seepage Management Pilot	921,344	141,933	175,328	68,501	81,087	1,388,193
Wastewater Reuse Technology Pilot	277,899	519,260	180,702	328,125	671,875	1,977,861
Acme Basin B Discharge	501,049	1,722,354	17,671	0	0	2,241,074
Strazzula Wetlands	353,158	17,307,297	17,364,157	2,509,692	0	37,534,304
Site 1 Impoundment	400,221	200,973	8,394,207	0	0	8,995,401
Broward County Water Preserve Area	13,086,897	7,946,074	0	0	0	21,032,971
C-4 Structure (previously Dade-Broward Levee, C-4 Eastern Structure)	90,119	102,682	0	0	0	192,801
Bird Drive Recharge Area	576,565	0	93,145	653,931	741,912	2,065,553
Water Preserve Area Conveyance	24,182	1,552,112	0	0	0	1,576,294
TOTAL	**271,887,425**	**207,989,337**	**201,778,940**	**234,147,013**	**206,361,834**	**1,122,164,549**

Accomplishments of CERP Projects and Critical Projects in FY 2003 were as follows:

- Acquired major land parcels including portions of the C-43 Basin Storage Reservoir, Indian River Lagoon, North Palm Beach County, Biscayne Bay Coastal Wetlands, Bird Drive Recharge Area, Broward County Water Preserve Area (WPA) and Southern Corkscrew Regional Ecosystem Watershed (CREW) Critical Restoration Project.
- Entered into a $30 million Wetland Reserve Program agreement with the USDA for restoration of Allapattah Ranch.
- Completed the Restoration Coordination and Verification (RECOVER) Monitoring and Assessment Plan and began implementation of several monitoring projects.
- Initiated a Master Agreement between the SFWMD and USACE to implement and construct authorized projects under the CERP, which will enable the SFWMD to receive funding credit for both construction and land acquisition associated with CERP projects.
- Developed and pursued opportunities to enter into public private partnerships to help expedite the CERP implementation.
- Identified methods to work cooperatively with the USACE and the State of Florida to expedite the building of CERP projects in a timely manner.
- Refined the Indian River Lagoon Feasibility Study to meet the state and federal requirements of a Project Implementation Report.
- Continued implementation of the Pilot Project Design Report (PPDR) and Project Implementation Report (PIR) phases of projects with approved Programmatic Management Plans (PMPs).

- Continued implementation of the PMPs.
- Completed the PMP for the Aquifer Storage and Recovery Regional Study.

Objectives for nonfederal funding of CERP Projects and Critical Projects for FY 2004 are planned and described below:

- Implement the CERP program activities, Projects, Critical Restoration Projects and Feasibility Studies within defined costs, schedule and scope.
- Continue implementing the PPDR and PIR phases of projects with approved PMPs, such as Lake Okeechobee Watershed, C-43 Basin Storage Reservoir, EAA Storage Reservoir, Water Conservation Area 3 Sheet Flow Enhancement, North Palm Beach County, Biscayne Bay Coastal Wetlands, C-111N Spreader Canal, Southern Golden Gates Restoration, L-31N Seepage Management and Indian River Lagoon.
- Continue implementing Critical Restoration Projects Ten Mile Creek WPA, Western Tamiami Trail Culverts, Western C-4 Water Control Structure, Southern CREW and Imperial River Flowway and Lake Trafford.
- Acquire program-wide parcels of land according to the land acquisition schedule.
- Continue implementing the RECOVER management plan.
- Continue implementing the other programmatic area management plans (Program Management, Program Controls, Public Involvement and Outreach, Environmental and Economic Equity, Data Management and Interagency Modeling Center).
- Continue development of the Southwest Florida and Florida Bay/Florida Keys Feasibility Studies.

Please refer to the 2003 CERP Annual Report (available from http://www.sfwmd.gov) prepared pursuant to Section 373.470(7), F.S. by the SFWMD and the FDEP for status of the following CERP Projects, Critical Projects and Feasibility Studies:

- Flow to Northwest and Central Water Conservation Area 3A.
- Loxahatchee National Wildlife Refuge Internal Canal Structures.
- Lake Istokpoga Regulation Schedule (now Lake Okeechobee Watershed Project).
- South Miami-Dade Reuse.
- Lake Okeechobee Water Retention/Phosphorus Removal.
- Broward County Secondary Canal System.
- Water Preserve Areas Feasibility Study.
- Broward County Water Preserve Areas.
- Western Tamiami Trail Culverts.

Project details are available from http://www.evergladesplan.org.

Districtwide Water Supply Development Efforts

The SFWMD's efforts in water conservation and reuse include projects funded by the Alternative Water Supply (AWS) Funding Program. Developing alternative water supplies is crucial in meeting the growing need for fresh water. A total of 131 projects were funded from 1997 through 2004. The total cost of the projects was $404 million of which $29.5 million was provided by the SFWMD's Alternative Water Supply Funding Program, creating 353 million gallons per day (MGD) of alternative water supply. In FY 2004, 34 projects were funded, with a total SFWMD funding of $4.5 million and total project costs of $102 million. When complete, these projects will generate 101 MGD of unconventional or alternative supplies, offsetting the use of potable water.

To encourage alternative water supply grant applications, workshops were held throughout the District to provide information and technical assistance to potential applicants.

2000 Kissimmee Basin Water Supply Plan

Plan Organization

An evaluation of the demands and water resources for the Kissimmee Basin (KB) Planning Area suggests that the groundwater supplies may not be sufficient to meet the 2020, 1-in-10 year drought water supply needs of the planning area. In addition, the SFWMD is required to ensure that it is in compliance with the Seminole Water Rights Compact between the Seminole Tribe of Florida, the State of Florida and the SFWMD. The compact entitles the Brighton Seminole Tribe to 15 percent of the total amount of water that can be withdrawn from local SFWMD canals, and access to a fractional share of surface waters from Lake Okeechobee for use on reservation lands within the Lakeshore Perimeter Basin.

In the *Kissimmee Basin Water Supply Plan* (SFWMD, 2000b), the SFWMD identified 14 recommendations. These recommendations were grouped into seven strategies to construct facilities to provide alternative sources of water. The recommendations in this plan are organized into three groupings; those pertaining to the Orange-Osceola County area, those pertaining to the Lake Istokpoga-Indian Prairie Basin area and related implementation strategies that apply to both areas. An examination of the identified options indicates that these groupings can be further subdivided based upon the approach or strategy that each takes in trying to address possible harm to the resource. Seven strategies were identified in this plan:

Orange-Osceola County Strategies

1. Minimize Floridan Aquifer drawdown through recharge
2. Minimize Floridan Aquifer drawdown through reduction of demands
3. Optimize use of the Floridan Aquifer and develop alternative sources

Lake Istokpoga-Indian Prairie Basin Strategies

4. Develop alternative water resources
5. Develop a water management plan for the Lake Istokpoga-Indian Prairie Basin

Related Strategies

6. Coordination among water management districts
7. Ensure consistency between planning, development and water use permitting both internally and between the water management districts

Information Provided

The summary of each of the seven strategies includes a description, a list of recommendations, funding sources, implementing agencies, costs to nonfederal entities (primarily the SFWMD) and estimates of total District staff time required in FTEs to implement the option. The schedule and costs to implement the recommendations in the

KB Water Supply Plan over the next five fiscal years are summarized in **Table 4** at the end of this section. In addition, estimates are provided (to the extent that can be determined) of the amount of water that will be made available for each recommendation in **Table 5**, also at the end of this section.

Strategies and recommendations are identified by a numbering system that corresponds to that used in the KB Water Supply Plan. For each option, a description is provided of changes in the plan scope or implementation that have occurred since the last *Five-Year Water Resource Development Work Program* (SFWMD, 2003).

Strategies and Recommendations

Orange-Osceola County Area

Strategy 1. Minimize Floridan Aquifer Drawdown through Recharge

Description / Discussion

This strategy involves reducing the amount of projected drawdown on the Floridan Aquifer by placing more water into the aquifer to replenish the amount removed. The identified sources for this recharge are reclaimed water and storm water. To minimize Floridan Aquifer drawdown through recharge, wastewater and stormwater reuse, reservoirs, drainage wells and aquifer storage and recovery (ASR) options were investigated. Evaluation of these options requires the utilization of numerical models and the collection of hydrologic information for the construction of these models.

Recommendations

1.1 Develop a regional reclaimed water optimization plan
1.2 Develop stormwater reuse master plans

Total Costs of Projects / Recommendations

The total costs of projects/recommendations associated with minimizing Floridan Aquifer drawdown through recharge are approximately $155,000, with 1.45 FTEs, for the period from FY 2004 through FY 2008.

Quantity of Water Potentially Available

See **Table 5** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

- Regional Reclaimed Water Optimization Plan – SFWMD, United States Geological Survey (USGS) and local governments
- Stormwater reuse master plans – SFWMD and local governments

Implementing Agencies

- Regional Reclaimed Water Optimization Plan – SFWMD, USGS, FDEP and local governments
- Stormwater reuse master plans – SFWMD and local governments

Summary of Changes / Implementation from the Previous Work Program

Develop a Regional Reclaimed Water Optimization Plan. During FY 2001 and FY 2002, four projects were implemented by the SFWMD toward developing a regional reclaimed water optimization plan for a total of $270,000. These projects included installation of climatic and shallow aquifer monitoring stations and Phase 1 of the Reclaimed Water Injection Pilot Study. Activities proposed for FY 2003 through FY 2004 include a conclusion of the climate and groundwater level monitoring and the continuation of the central Florida lakes monitoring network. Phase 2 of the Reclaimed Water Injection Pilot Study will not continue due to lack of local interest. Also in FY 2004, the SFWMD will finalize a Reclaimed Water Master Plan for central Florida that will quantify the availability of reclaimed water supplies, identify major users and evaluate the use of reclaimed water in offsetting freshwater demands projected for 2025. Total funding proposed for Recommendation 1.1 for FY 2004 is estimated at $80,000 and 0.6 FTEs.

Develop Stormwater Reuse Master Plans. During FY 2003, the SFWMD continued its support of the Artificial Recharge Project. Phase 2 of the Drain Well Treatment Pilot Project was not initiated due to lack of local interest. The stormwater reuse master plans will continue with the estimation of water availability from Shingle and Boggy Creeks, which act as regional collection systems. Recommendation 1.2 for FY 2004 is estimated to use 0.4 FTEs and no funding. The SFWMD has chosen to complete this work in-house.

Strategy 2. Minimize Floridan Aquifer Drawdown through Reduction of Demands

Description / Discussion

Urban and agricultural conservation and reuse can minimize drawdown on the Floridan Aquifer. An improved Districtwide Comprehensive Water Conservation Program was recommended and is being implemented. This program will further assist utilities in developing their own customized water conservation programs and establish efficiency goals that are cost-effective and achievable.

Recommendations

2.1 Develop a comprehensive water conservation program

Total Costs of Projects / Recommendations

The total cost of developing a comprehensive water conservation program will be divided each year among all four regional water supply planning and development efforts. The Districtwide total costs for projects/recommendations associated with water conservation are presented in **Table 1** in the Districtwide Efforts section of this document.

Quantity of Water Potentially Available

See **Table 5** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

The SFWMD is funding the development of the Comprehensive Water Conservation Program.

Implementing Agencies

The SFWMD and local governments are implementing the development of the Comprehensive Water Conservation Program.

Summary of Changes / Implementation from the Previous Work Program

Develop a Comprehensive Water Conservation Program. For status on the implementation of the Comprehensive Water Conservation Program, see the Districtwide Water Resource Development Efforts section of this document.

In addition, Alternative Water Supply Grants totaling $400,000 were awarded to the City of St. Cloud, the City of Kissimmee and Orange County Utilities for FY 2004. See the Districtwide Water Supply Development Efforts section of this document for discussion of the SFWMD's Alternative Water Supply Funding Program.

Strategy 3. Optimize Use of the Floridan Aquifer and Develop Alternative Sources

Description / Discussion

Alternative water source options identified in the KB Water Supply Plan include reclaimed water, surface water, brackish groundwater and additional fresh groundwater. Technical and resource-based issues will be evaluated to quantify the availability of surface water resources in the planning and development area. The collection of the necessary

hydrologic information and development of models will be performed to accurately identify resource concerns and determine the optimized use of the Floridan Aquifer.

Recommendations

3.1 Research and develop alternative water supplies
3.2 Determine the optimized use of the Floridan Aquifer

Total Costs of Projects / Recommendations

The total costs of projects/recommendations associated with optimizing the use of the Floridan Aquifer and developing alternative water supply sources are approximately $452,000, with 4.05 FTEs, for the period from FY 2004 through FY 2008.

Quantity of Water Potentially Available

See **Table 5** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

The SFWMD will fund both Strategy 3 recommendations with local governments assisting with Recommendation 3.2, determining the optimized use of the Floridan Aquifer.

Implementing Agencies

The SFWMD will implement both recommendations with local governments assisting with Recommendation 3.2.

Summary of Changes / Implementation from the Previous Work Program

Research and Develop Alternative Water Supplies. The SFWMD applied 0.95 FTEs toward implementing this recommendation during FY 2002. This work involved District staff developing a surface water management model for the Kissimmee Upper Chain of Lakes. Work on the model was completed in FY 2003 and will be used in a systemwide evaluation in FY 2004. For FY 2004 through FY 2008, the SFWMD plans to continue work on developing supplies from the Upper Chain of Lakes and tributary creeks in the northern basin and spending an additional $175,000 and 1.4 FTEs to complete this effort. The project will be completed in FY 2005 and will be included in the effort to determine a minimum flow and level (MFL) for the Upper Chain of Lakes and the Kissimmee River by 2006.

Determine the Optimized Use of the Floridan Aquifer. From FY 2001 through FY 2003 the SFWMD constructed six deep Floridan Aquifer wells as part of the hydrologic investigations identified under this recommendation. In addition, several shallow wells were constructed as part of Shallow-Floridan Aquifer Study. The cost of these wells for FY 2001 through FY 2003 totaled $3.1 million and was shared between the KB and LEC Planning

Areas. In addition, efforts to share information were coordinated with the Southwest Florida Water Management District (SWFWMD) and the St. Johns River Water Management District (SJRWMD). In FY 2002, the SFWMD and the SJRWMD agreed to use the East Central Florida Model as a basis for future regional water supply planning in Orange, Osceola and Polk Counties. Construction of the updated model began in FY 2003 and will continue in FY 2004 using 1.4 FTEs. Funding for this project is estimated to total $277,000 and is expected to be complete in FY 2005, employing 2.65 FTEs.

Lake Istokpoga-Indian Prairie Basin

Strategy 4. Develop Alternate Water Resources

Description / Discussion

Alternative water resources will be developed for the KB Planning Area, including Lake Okeechobee, the Kissimmee River and additional groundwater. A plan was developed proposing the operation of two or more pumps to move water from Lake Okeechobee to the KB Planning Area. Additionally, as a result of restoration efforts, the KB Water Supply Plan proposed investigating the availability of water supplies from the Kissimmee River.

Recommendations

4.1 Develop an operational plan for backpumping from Lake Okeechobee
4.2 Investigate the availability of water from the Kissimmee River

Total Costs of Projects / Recommendations

In FY 2002, the SFWMD initiated, and in FY 2003 continued, development of an operational plan for the southern Indian Prairie Basin. This plan focuses on the development of operational protocol for pumps G-207 and G-208 that move water from Lake Okeechobee into the southern Indian Prairie Basin below SFWMD structures S-70 and S-75. In this plan, the SFWMD will consider the recently developed water supply and environmental (WSE) and supply side management schedules developed for Lake Okeechobee. The use of water from Lake Okeechobee for the Indian Prairie Basin was evaluated during the development of the KB and LEC Plans and was deemed feasible. Development of this operational plan is scheduled for completion in FY 2004 using no funding for contracts and 2.5 FTEs.

Quantity of Water Potentially Available

See **Table 5** for the quantity of water potentially available by FY 2004 through FY 2008.

Funding Sources

These projects will be completed using SFWMD FTEs and no funding beyond FTEs has been identified.

Implementing Agencies

District resources (FTEs) will be used in implementing this project.

Summary of Changes / Implementation from the Previous Work Program

Develop an Operational Plan for Backpumping from Lake Okeechobee. The use of water from Lake Okeechobee was modeled during the development of the LEC 2020 water supply planning process and the CERP process. Water from Lake Okeechobee backpumping will be limited for use within the southern Indian Prairie Basin, for which an operational plan is being developed. The amount of water will be monitored and will stay within the limits identified during the LEC and CERP processes unless revised limits are otherwise identified.

Investigate the Availability of Water from the Kissimmee River. The restoration of the Kissimmee River is one of several top priorities of the SFWMD and until such time as the success of the restoration is determined, use of water from the Kissimmee River for those portions being restored will be evaluated on a case-by-case basis. In 2005, the District foresees investigating water use from the Kissimmee River for areas not under restoration efforts, specifically areas below the S-65E structure. Work on this effort is expected to be completed by FY 2006 using an estimated 1.5 FTEs.

Strategy 5. Develop a Water Management Plan for the Lake Istokpoga-Indian Prairie Basin

Description / Discussion

A water management plan needs to be developed for the Lake Istokpoga-Indian Prairie Basin. The plan should evaluate a lifting of the moratorium on use of additional surface water within the Indian Prairie Basin. This would include resolving issues related to the current regulation and minimum operation schedules, and establishing a minimum level for Lake Istokpoga. An operational plan for control structures on the lake and the SFWMD canal system must be developed. Also, regional storage needs, such as ASR and a surface water storage basin will also be evaluated.

Recommendations

5.1 Develop a water management plan for the Lake Istokpoga-Indian Prairie Basin

5.2 Evaluate regional storage

Total Costs of Projects / Recommendations

From FY 2004 through FY 2005, 3.5 FTEs have been allocated to the projects/recommendations within this strategy. Beginning in FY 2004 and continuing in FY 2005, the basin storage evaluation will be associated with the Lake Okeechobee Watershed project, which is evaluating regional storage basins for phosphorous regulation.

Quantity of Water Potentially Available

See **Table 5** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

These recommendations will be funded through SFWMD sources and the CERP. The agencies that may potentially fund the projects are the SFWMD, the SWFWMD, the FDEP, the USACE and local governments.

Implementing Agencies

- Water management plan development – SFWMD and USACE
- Regional storage evaluation – SFWMD and SWFWMD

Summary of Changes / Implementation from the Previous Work Program

Water Management Plan for Lake Istokpoga-Indian Prairie Basin. The SFWMD initiated work on the development of the management plan during FY 2003 for the southern Lake Istokpoga – Indian Prairie Basin. In FY 2004, 1.5 FTEs are assigned to the development of the water management plan for the southern basin. A complete draft of this document is anticipated by December of 2003.

The evaluation of the northern Lake Istokpoga – Indian Prairie Basin will begin subsequent to revising the Lake Istokpoga operating schedule. During FY 2003, the Istokpoga Regulation Schedule review was incorporated into the Lake Okeechobee Watershed evaluation to assist in that project. From FY 2004 through FY 2006 the USACE will be evaluating this regulation schedule. A MFL is scheduled for Lake Istokpoga by 2004 and research on the lake levels has begun.

Evaluate Regional Storage. No scheduled activities were proposed for this recommendation in the *Kissimmee Basin Water Supply Plan* (SFWMD, 2000b) during FY 2003. The SFWMD in cooperation with the SWFWMD and the FDEP initiated two studies to examine the fate of organisms influenced by aquifer storage and recovery (ASR). Beginning in FY 2004 and continuing in FY 2005, the surface water storage evaluation will be associated with the Lake Okeechobee Watershed project, which is evaluating regional storage basins for phosphorous regulation, several of which are located in the Indian Prairie Basin.

Testing of high volume surface water ASR in the Kissimmee Basin is currently not feasible; however, pilot ASR efforts are being conducted in the LEC Planning Area in conjunction with the CERP. These studies will continue in FY 2004 and will be coordinated with the other agencies.

The KB Water Supply Plan also considers a regional reservoir. While not deemed feasible for uses proposed under the KB Water Supply Plan, there is a regional reservoir

proposed north of Lake Okeechobee under the CERP. Efforts to evaluate the utility of such a reservoir will remain under CERP planning efforts that identify construction initiatives for 2010.

Related Strategies

Strategy 6. Coordination among Water Management Districts

Description/Discussion

The SFWMD will coordinate with the SJRWMD, the SWFWMD and the FDEP for the purpose of maximizing consistent criteria and approaches concerning the following: resource protection criteria, hydrologic investigations, improved hydrologic modeling; local sources first, MFLs and water shortage declarations.

Recommendations

6.1 Coordinate with the SJRWMD, the SWFWMD and the FDEP

Total Costs of Projects / Recommendations

In FY 2004, the SFWMD will continue to participate in the East Central Florida Water Supply Initiative sponsored by Orange County and the SJRWMD. In addition, the SFWMD, the SWFWMD and the SJRWMD continue to meet in accordance with the interdistrict memorandum of understanding, and to cooperate on several construction and exploratory projects. The districts have exchanged water management data, such as water use projections for central Florida and geologic/hydrologic data for coordination on the Eastern Region Groundwater Model. The SFWMD and the SJRWMD began meeting on a memorandum of understanding to delegate water use permitting authority for certain permits in Orange County. Similar efforts to coordinate with other water management districts are expected to require one FTE of SFWMD staff each fiscal year from FY 2004 through FY 2008, for a total of five FTEs. Future efforts will involve the continuation of the memorandum of understanding process and the finalization of the water use permitting delegation agreement, but will focus on cooperative efforts to delineate the timing and extent of water supply concerns in central Florida through the use of groundwater modeling.

Quantity of Water Potentially Available

No water will be made available through this recommendation.

Funding Sources

The SFWMD will fund this recommendation.

Implementing Agencies

The SFWMD will implement this recommendation.

Summary of Changes / Implementation from the Previous Work Program

Intergovernmental Coordination. The SFWMD dedicated one FTE to interdistrict and interagency efforts during FY 2001 through FY 2003. This level of effort is expected to continue through FY 2008.

Strategy 7. Ensure Consistency between Planning and Water Use Permitting

Description / Discussion

Salient portions of the KB Water Supply Plan will be incorporated into the Consumptive Use Permitting (CUP) Program through rulemaking.

Recommendations

7.1 Continue rulemaking efforts

Total Costs of Projects / Recommendations

This recommendation has been incorporated into Recommendation 40 of the LEC section (**Table 10**).

Quantity of Water Potentially Available

No water will be made available through this recommendation.

Funding Sources

The SFWMD will fund this recommendation.

Implementing Agencies

The SFWMD will implement this recommendation.

Summary of Changes / Implementation from the Previous Work Program

Rulemaking. This recommendation has been incorporated into Recommendation 40 of the LEC section (**Table 10**).

Summary of KB Water Supply Plan Costs and Schedules

Table 4. Summary of Estimated Schedule and SFWMD Costs for Water Resource Development Recommendations in the KB Water Supply Plan

Strategies and Recommendations		Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon KB Plan Update in 2005											
		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total FY 2004–FY 2008	
		$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Orange-Osceola County Area													
Strategy 1: Minimize Floridan Aquifer Drawdown through Recharge													
1.1	Develop a regional reclaimed water optimization plan	80	0.60	50	0.35	Complete						130	0.95
1.2	Develop stormwater reuse plans	0	0.40	25	0.10	Complete						25	0.50
	Subtotal	**80**	**1.00**	**75**	**0.45**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**155**	**1.45**
Strategy 2: Minimize Floridan Aquifer Drawdown through Reduction of Demands													
2.1	Develop a comprehensive water conservation program	See the Districtwide Water Resource Development Efforts section (**Table 1**)											
Strategy 3: Optimize Use of the Floridan Aquifer and Develop Alternative Sources													
3.1	Research and develop alternative water supplies	75	0.40	100	1.00	Complete						175	1.40
3.2	Determine the optimized use of the Floridan Aquifer	77	1.40	200	1.25	Complete						277	2.65
	Subtotal	**152**	**1.80**	**300**	**2.25**	**0**	**.00**	**0**	**.00**	**0**	**.00**	**452**	**4.05**
Lake Istokpoga-Indian Prairie Basin													
Strategy 4: Develop Alternative Water Resources													
4.1	Develop an operational plan for backpumping from Lake Okeechobee	0	2.50	Complete								0	2.50
4.2	Investigate the availability of water from the Kissimmee River	0	0.00	0	0.50	0	1.00	Complete		Complete		0	1.50
	Subtotal	**0**	**2.50**	**0**	**0.50**	**0**	**1.00**	**0**	**0.00**	**0**	**0.00**	**0**	**4.00**
Strategy 5: Develop a Water Management Plan for the Lake Istokpoga-Indian Prairie Basin													
5.1	Develop a water management plan for the Lake Istokpoga-Indian Prairie Basin	0	1.50	0	2.00	Complete						0	3.50
5.2	Evaluate regional storage	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	Subtotal	**0**	**1.50**	**0**	**2.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**3.50**
Related Strategies													
Strategy 6: Coordination among Water Management Districts													
6.1	Coordinate with the SJRWMD, the SWFWMD and the FDEP	0	1.00	0	1.00	0	1.00	0	1.00	0	1.00	0	5.00
	Subtotal	**0**	**1.00**	**0**	**1.00**	**0**	**1.00**	**0**	**1.00**	**0**	**1.00**	**0**	**5.00**
Strategy 7: Ensure Consistency between Planning and Water Use Permitting													
7.1	Continue rulemaking efforts	Incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**). "A List" and "B List" consumptive use permitting rules have been adopted.											
	Subtotal	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
	TOTAL	**232**	**7.80**	**375**	**6.20**	**0**	**2.00**	**0**	**1.00**	**0**	**1.00**	**607**	**18.00**

Summary of the Quantity of Water to Be Made Available by Implementation of the KB Water Supply Plan

Table 5. Water Made Available Through Implementation of the KB Water Supply Plan in FY 2004 and by FY 2008

Recommendation		Estimated Water Made Available (MGD)	
		In FY'04	By FY'08
1	**Florida Aquifer Drawdown – Recharge**		
1.1	Develop a Regional Reclaimed Water Optimization Plan	3.50	3.50
1.2	Develop Stormwater Reuse Master Plans	0.00	0.00
2	**Florida Aquifer Drawdown – Demands**		
2.1	Develop a Comprehensive Water Conservation Program	0.90	4.00
3	**Floridan Aquifer – Alternative Sources**		
3.1	Research and Develop Alternative Water Supplies	3.00	7.70
3.2	Determine Optimized Use of the Floridan Aquifer	0.00	0.00
4	**Alternative Water Resources**		
4.1	Develop an Operational Plan for Backpumping from Lake Okeechobee	0.00	41.00
4.2	Investigate the Availability of Water from the Kissimmee River	0.00	0.00
5	**Lake Istokpoga-Indian Prairie Basin**		
5.1	Develop a Water Management Plan for the Lake Istokpoga-Indian Prairie Basin	0.00	15.00
5.2	Evaluate Regional Storage	0.00	0.00
6	**Water Management Coordination**		
6.0	Interdistrict and FDEP Coordination	0.00	0.00
7	**Planning and Water Use Permitting**		
7.0	Continue Rulemaking Efforts	0.00	0.00
	TOTAL	**7.40**	**71.20**

1998 Upper East Coast Water Supply Plan

Plan Organization

Several issues were identified in the *Upper East Coast (UEC) Water Supply Plan* (SFWMD, 1998a) that have been addressed since the Governing Board approved the plan in February 1998. These issues include surface water availability, Floridan Aquifer water quality, freshwater discharges to the St. Lucie Estuary, saltwater intrusion vulnerability and potential cumulative impacts to wetlands. Seven water source options were identified to address these issues:

1. Surface water storage (reservoirs)
2. Aquifer storage and recovery
3. Floridan Aquifer
4. Conservation
5. Wastewater reuse
6. Utility interconnects
7. Related implementation strategies

Water resource development recommendations were made for each of these options. Analyses in the plan indicated that expansion of the Surficial Aquifer System (SAS), primarily along the coast, is limited. Development of the options listed above was necessary to meet projected future demands for urban and agricultural water demands.

Information Provided

The summary of each of the seven water resource development options includes a description, a list of recommendations, funding sources, implementing agencies, costs to SFWMD and estimates of total District staff time required in FTEs to implement the option. The schedule and costs to implement the recommendations in the UEC Water Supply Plan over the next five fiscal years are summarized in **Table 6** at the end of this section. In addition, estimates are provided (to the extent that can be determined) of the amount of water that will be made available for each recommendation in **Table 7**, also at the end of this section. By the end of FY 2004, it is estimated that over 23 million gallons per day (MGD) of water will be made available by implementation of the plan.

The water resource development projects are listed to correspond with the options and recommendations in the UEC Water Supply Plan. For each option, a description is provided of changes in the plan scope or implementation that has occurred since the last *Five-Year Water Resource Development Work Program* (SFWMD, 2003) was published.

Water Resource Development Options and Recommendations

Many of the recommendations in the UEC Water Supply Plan were completed by FY 2003. The exceptions include ongoing programs, such as the Floridan Aquifer Monitoring Program and programs that extend beyond 2003, such as the Ten Mile Creek Critical Restoration Project and the Indian River Lagoon Project. The UEC Water Supply Plan was originally scheduled for update in 2003. However, with the FDEP and the other water management districts' concurrence, the deadline was extended to June 2004 so the UEC Plan update completion date will be similar with the updates of all of the other regional water supply plans in the State of Florida.

1. Surface Water Storage

Definition / Discussion

This option involves the capture and storage of excess surface water during rainy periods and subsequent release during drier periods for environmental and human uses. Regionally, surface water storage could be used to attenuate freshwater flows to the St. Lucie Estuary and the Indian River Lagoon during rainy periods and meet minimum flows during drier periods. In addition, these facilities could increase surface water availability for current and projected agricultural uses, and decrease the demand on the Floridan Aquifer. This option also includes supporting the improvement of the C-23 Canal.

Recommendations

1.1 Complete the Indian River Lagoon Feasibility Study
1.2 Identify, design and construct other regional attenuation facilities
1.3 Support the design and construction of the Ten Mile Creek Project
1.4 Develop and adopt minimum flows and levels (MFLs) for the St. Lucie Estuary
1.5 Increase storage and conveyance in C canals (C-23 Canal Dredging)

Total Costs of Projects / Recommendations

The Indian River Lagoon Feasibility Study has been incorporated into the larger Indian River Lagoon Project that is part of the CERP (**Table 3**). The Ten Mile Creek Project, a Critical Project, has also been incorporated into the CERP (**Table 2**).

Quantity of Water Potentially Available

See **Table 7** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

- Indian River Lagoon Feasibility Study – SFWMD (50 percent) and USACE (50 percent)
- Ten Mile Creek – SFWMD, St. Lucie County, USACE (50 percent) and other public and private interests (50 percent)
- St. Lucie Estuary MFLs – SFWMD
- C canal storage and conveyance capacity – SFWMD

Implementing Agencies

The SFWMD is the sole implementing agency for most of the projects recommended for surface water storage. Exceptions are the Indian River Lagoon Feasibility Study and the Ten Mile Creek Critical Restoration Project, which are cooperative efforts with the USACE.

Summary of Changes / Implementation from the Previous Work Program

Indian River Lagoon Feasibility Study. The Indian River Lagoon Feasibility Study is a cost-shared project between the SFWMD and the USACE. The draft report has been completed and public workshops were conducted for interested parties. The final report incorporated public and agency comment and was completed in August 2002. The preliminary selected plan evaluated several alternatives: wetland restoration, stormwater detention reservoirs and stormwater treatment areas (STAs). The Indian River Lagoon-South Final Feasibility Study will be combined with an addendum in the Project Implementation Report (PIR), which will satisfy the 2000 Water Resource Development Act requirements. The draft PIR was released in December 2003 for review and comment and will be finalized in FY 2004.

Other Regional Attenuation Facilities. The SFWMD and the USACE are to determine if additional regional attenuation facilities are needed. This recommendation is ancillary to the Indian River Lagoon-South Feasibility Study. The feasibility study, which was completed in August 2002, included recommendations for all known storage in the region. Any additional storage needs could be identified through the adaptive management processes including Restoration Coordination and Verification (RECOVER).

Ten Mile Creek Critical Restoration Project. The Ten Mile Creek Critical Restoration Project is a cost-share project between the SFWMD, the USACE and local sponsors. It is closely linked to the Indian River Lagoon Feasibility Study for water preserve areas. Detailed design, archeological surveys and contractor selection have been completed. The project involves construction of a 550-acre reservoir (maximum depth of 10 feet) and a 110-acre stormwater treatment area (maximum depth of 4 feet). This project is located immediately west of the Gordy Road structure in St. Lucie County and will provide storage and treatment of storm water from the Ten Mile Creek Basin, the largest subbasin discharging to the North Fork of the St. Lucie River. Ground breaking on the project occurred in November 2003. The construction will take less than two years to complete and will cost approximately $26 million.

Minimum Flows and Levels for the St. Lucie River and Estuary. The Governing Board approved amendments to Rule 40E-8 establishing MFLs for the St. Lucie River and Estuary in September 2002. Research and monitoring will be developed in coordination with the UEC Water Supply Plan update.

Storage and Conveyance in C Canals. This recommendation will be realized under the SFWMD's Canal Conveyance Capacity Program. The Canal Conveyance Capacity Program is a 12-year plan for performing dredging in six canals in the SFWMD, one of which is the C-23 Canal located in the UEC Planning Area. These canals were prioritized based on technical factors, such as the severity of deposition within the canal, and the likely economic impacts of flooding. The C-23 Canal is the second canal on the Canal Conveyance Capacity Program priority list and is being dredged in four phases to complete the canal from G-78 to S-48. The portion from G-78 to G-79 is being evaluated for possible dredging, and could become Phase 5.

Phase 1 (8.5 miles) of the dredging project was completed in November 2001. Phase 2 (7.4 miles) was also completed. Phase 3, the remaining 4.5 miles from the eastern end of Phase 2 to the S-97 structure, was completed in FY 2002. Field surveying for Phase 4, between S-97 and S-48, is complete. The survey will be drafted and evaluated in FY 2004 to determine if Phase 4 is necessary. Funding for Phase 4 dredging (if needed), has not been budgeted. The original estimate to complete Phase 4 was approximately $800,000.

2. Aquifer Storage and Recovery

Definition / Discussion

Aquifer storage and recovery (ASR) is the underground storage of injected water into an acceptable aquifer during times when water is available, and the subsequent recovery of this water when it is needed. In southeastern Florida, the brackish portions of the Floridan Aquifer are typically used for storage or as source water for reverse osmosis-type operations.

Recommendations

2.1 Evaluate colocating ASR and surface water storage
2.2 Evaluate canal water quality for surface water ASR
2.3 Evaluate reactivating the demonstration project for Lake Okeechobee ASR
2.4 Explore rule changes to facilitate untreated water ASR
2.5 Develop rules to address conflicts with ASR and the Floridan Aquifer
2.6 Evaluate injecting excess surface water into the Floridan Aquifer for recharge
2.7 Evaluate injecting surface water to increase freshwater head

Total Costs of Projects / Recommendations

All of these recommendations have been incorporated into either the CERP or other planning area recommendations.

Quantity of Water Potentially Available

See **Table 7** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

Projects are funded by the SFWMD, except for those that are part of the CERP, which is co-funded by the SFWMD and the USACE.

Implementing Agency

Implementing agencies include the SFWMD, the USACE, the FDEP and the United States Environmental Protection Agency (USEPA).

Summary of Changes / Implementation from the Previous Work Program

Evaluation of ASR Recommendations. Four of the seven recommendations made for ASR in the UEC Water Supply Plan have been incorporated into the ASR pilot projects being implemented as part of the CERP. The SFWMD is in the planning and development phase of Recommendations 2.1 and 2.2. Reactivating the demonstration project for Lake Okeechobee ASR (Recommendation 2.3) is currently not feasible, but has been incorporated into the CERP ASR pilot projects for further evaluation.

Explore Rule Changes to Facilitate Untreated Water ASR. The SFWMD provided technical and legislative support to the FDEP for the sponsorship of Senate Bill 854/House Bill 705 regarding ASR in the 2001 Florida Legislative session. The bill was designed to allow for an exemption to the total coliform drinking water standard for ASR recharge water, provided die-off of these organisms could be demonstrated by the applicant. The bill did not make it into law. In November 2001, the SFWMD's Executive Director decided to forgo seeking a variance from existing ASR regulatory criteria and determined that ASR pilot projects will comply with applicable regulatory criteria. This decision may be revisited once results from studies being conducted by the SFWMD, the SWFWMD and the SJWMD regarding pathogen die-off have been completed.

Developing Rules and Evaluating Injecting Water. The remaining three recommendations are being implemented through the recommendations of other water supply plans. Revisions to the SFWMD's Water Use Basis of Review related to Floridan Aquifer use and ASR (Recommendation 2.5) will be incorporated into the upcoming rulemaking effort discussed under Recommendation 40 of the LEC Regional Water Supply Plan. The evaluation of injecting excess surface water into the Floridan Aquifer for recharge (Recommendation 2.6) has been incorporated into Recommendations 1.2 and 3.1 of the KB Water Supply Plan. The evaluation of injecting surface water to increase the freshwater head (Recommendation 2.7) has been incorporated into Recommendation 1 of the LEC Regional Water Supply Plan.

3. Floridan Aquifer

Definition / Discussion

The Floridan Aquifer is used by citrus growers in the UEC Planning Area primarily as a supplemental irrigation source when surface water availability is limited. During times of drought or other times of scarce surface water, water from the Floridan Aquifer is blended with available surface water. This blending reduces potential problems associated with water quality due to the brackish nature of Floridan Aquifer water. Water quality is critical in maintaining the sustainability of the Floridan Aquifer. The Floridan Aquifer is also becoming an important source of water to regional public water suppliers. The Floridan Aquifer water is nonpotable throughout the UEC Planning Area and requires desalination or blending prior to potable use. All coastal utilities have tapped the Floridan Aquifer for water to meet existing and future water needs including Fort Pierce Utilities Authority, Port St. Lucie, Martin County Utilities Jensen Beach and Tropical Farms (under construction) facilities and South Martin Regional Utilities.

Recommendations

3.1 Remove the Floridan Aquifer from the MFL priority list
3.2 Develop and implement a Floridan Aquifer monitoring network
3.3 Develop incentives for a Floridan Aquifer well abandonment program
3.4 Explore desalination concentrate disposal options
3.5 Evaluate recharge areas in central Florida

Total Costs of Projects / Recommendations

The total remaining costs of projects/recommendations associated with the Floridan Aquifer in the UEC are approximately $634,000 utilizing 2.00 FTEs.

Quantity of Water Potentially Available

See **Table 7** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

- Floridan Aquifer monitoring network – SFWMD, USDA-NRCS and USGS
- Floridan well abandonment – SFWMD and USDA-NRCS

Implementing Agencies

Implementing agencies include the SFWMD, the USDA-NRCS and the USGS.

Summary of Changes / Implementation from the Previous Work Program

Remove the Floridan Aquifer from the MFL Priority List. The Floridan Aquifer has been removed from the SFWMD's list for establishment of MFL criteria based on the recommendation and analysis associated with the UEC Water Supply Plan. The need to include the Floridan Aquifer on future MFL priority lists will be reassessed during future updates to this plan.

Develop a Comprehensive Floridan Aquifer Monitoring Network. The SFWMD established a monitoring network to collect data and evaluate the relationships between water levels, water quality and water use during FY 2000. The network consists of 33 sites distributed across the UEC Planning Area. The SFWMD monitors twelve locations, consisting of 14 wells. The remaining 21 locations, consisting of 57 wells, are monitored under contract by the USDA-NRCS. Data collected from this monitoring program is stored DBHYDRO, the SFWMD's corporate environmental database. This effort will continue until sufficient data are collected to establish relationships between water levels, water use and water quality.

Develop Floridan Well Abandonment Program. The SFWMD entered into an agreement with the USDA-NRCS to share the cost of well plugging and irrigation conversion projects in Martin and St. Lucie Counties. Since 1998, 39 wells were closed in St. Lucie County and three wells were closed in Martin County. The SFWMD contribution to the program has been $75,000 since 1998.

Explore Desalination Concentrate Disposal Options. The SFWMD participated in a workshop with the SJRWMD, the FDEP and the USEPA concerning options for disposal of concentrate from desalination treatment facilities. Potential methods of disposal include deep well injection, surface water discharge and blending with reclaimed water. For deep well injection, reclassifying concentrate to something other than industrial waste was discussed to reduce construction costs. For surface water discharges, the FDEP indicated a desire to assist applicants in characterizing water quality in receiving bodies and of the concentrate (based on source quality and treatment method), and applying an up front screening level process to identify potential concerns, including toxicity. Reclassifying concentrate to something other than industrial waste was discussed during the 2000 legislative session, but no legislative changes have occurred to date related to this issue.

Evaluate Floridan Aquifer Recharge Areas. This recommendation was evaluated in development of the KB Water Supply Plan. It was determined that activities in the Kissimmee Basin region will not effect Floridan Aquifer water availability in the UEC Planning Area.

4. Conservation

Definition / Discussion

This option requires implementation of water conservation measures that achieve long-term permanent reductions in water use rates. In 1992, the SFWMD amended its water use permitting rules to incorporate specific mandatory water conservation requirements for each use type. Use types include public water suppliers, commercial/industrial users, landscape and golf course users and agricultural users.

Recommendations

4.1 Promote water conservation
4.2 Provide cost-share funding for mobile MILs

Total Costs of Projects / Recommendations

The total costs of the conservation program and the MILs are discussed in the Districtwide Water Resource Development Efforts section.

Quantity of Water Potentially Available

See **Table 7** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

The SFWMD and local sponsors will fund the conservation recommendations.

Implementing Agency

The SFWMD and local sponsors will implement the conservation recommendations.

Summary of Changes / Implementation from the Previous Work Program

Promote Water Conservation. The SFWMD established the Comprehensive Water Conservation Program. The program is discussed in more detail in the Districtwide Water Resource Development Efforts section of this document.

Mobile Irrigation Labs (MILs). In FY 2003, $114,000 was spent in the UEC Planning Area on two urban MILs. This provides homeowners, condominium associations, golf courses and public buildings and parks with on-site analyses, system evaluations and water quality evaluations of their landscape irrigation systems. The Martin and St. Lucie urban labs were established in 1998 and 2000, respectively. There is also an agricultural lab that serves Martin, St. Lucie and Okeechobee Counties, established in 1992 and fully funded by the USDA-NRCS.

The urban labs educate property owners/operators in irrigation efficiency, system design needs and proper irrigation scheduling. Each urban MIL completes about 140 evaluations per year, with potential water savings of 30 to 40 million gallons of water per year and an associated reduction in lawn chemicals and fertilizers leaving sites as runoff. The agricultural lab performed 31 evaluations in FY 2002 and saved 1,203 million gallons of water within the year.

5. Wastewater Reuse

Definition / Discussion

Reuse is the application of reclaimed water (highly treated wastewater) for a beneficial purpose. Potential uses of reclaimed water include landscape and agricultural irrigation, groundwater recharge, industrial activities and environmental enhancement. Existing reuse in the UEC Planning Area includes irrigation of golf courses and other green spaces, and groundwater recharge via percolation ponds in Martin County and southern St. Lucie County.

The use of reclaimed water in the UEC Planning Area has increased by almost 145 percent from 1995 levels to almost 9.5 MGD being reused in the UEC Planning Area during 2002. Most new large irrigation needs are being met with reclaimed water where available. This trend is projected to continue with the projects either underway or proposed by utilities in the region. Martin County is investigating the potential of developing a mandatory reuse zone, requiring new developments to use reclaimed water as part of their development orders.

Recommendations

5.1 Develop incentives for reuse
5.2 Evaluate reclaimed water system interconnects
5.3 Adopt rules related to wastewater reuse
5.4 Assist with reclaimed water projects involving groundwater recharge
5.5 Work with the FDEP on reclaimed water quality standards for groundwater recharge

Total Costs of Projects / Recommendations

The total remaining costs of projects/recommendations associated with wastewater reuse are incorporated into Recommendation 40 of the LEC Regional Water Supply Plan.

Quantity of Water Potentially Available

See **Table 7** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

The SFWMD is funding all of the wastewater reuse recommendations. Additionally, the development of additional reuse incentives is being funded through Alternative Water Supply funds.

Implementing Agency

The SFWMD is the implementing agency for all the wastewater reuse recommendations.

Summary of Changes / Implementation from the Previous Work Program

Reuse Coordination. The SFWMD continues its involvement in wastewater reuse at the state level, as well as at the local level. At the state level, the SFWMD has continued its participation on the Statewide Reuse Coordinating Committee, which consists of representatives from the five water management districts, the FDEP, the Department of Health, the Public Service Commission, the Florida Department of Agriculture and several other agencies. This committee coordinates reuse related activities statewide, and develops policies and approaches for encouraging reuse. The SFWMD has also continued to meet with the local FDEP district offices to coordinate reuse activities at the local level on specific projects.

Reuse Regulations. The SFWMD continues to work with the FDEP to develop project-level understanding of reclaimed water associated with Chapter 62-610, F.A.C., Reuse of Reclaimed Water and Land Application. In addition, during rulemaking in FY 2003, water reuse criteria in the SFWMD's Basis of Review for Water Use were updated. Beginning in FY 2003, this activity is incorporated into Recommendation 44 of the *Lower East Coast Regional Water Supply Plan* (SFWMD, 2000d).

Combining Reuse Efforts. Most of the reuse recommendations for the UEC Planning Area have been or will be incorporated into the recommendations for the same efforts within the LEC Planning Area. However, it should be noted that although a regional irrigation distribution system is not feasible in Northern Palm Beach County it might be feasible in the Upper East Coast Planning Area. Feasibility will be determined on a case-by-case basis. For example, Martin County is currently implementing a plan to regionalize wastewater treatment and reuse through interconnects. The evaluation of the recommendation to interconnect reclaimed water systems has been incorporated into Recommendation 43 and the reuse rule development has been incorporated into Recommendation 40 of the LEC Regional Water Supply Plan. Beginning in FY 2003, assisting with reclaimed water projects involving groundwater recharge will be incorporated into Recommendation 44 of the LEC Regional Water Supply Plan.

6. Utility Interconnects

Definition / Discussion

This option involves the bulk purchase of treated water from neighboring utilities in lieu of expanding an existing withdrawal and/or treatment facility. Also, interconnection of treated and/or raw water distribution systems between utilities can provide a measure of backup water service in the event of disruption of a water source, treatment facility or distribution system. Interconnections could also be established with utilities outside the UEC Planning Area or the SFWMD.

Several utilities in Martin and St. Lucie Counties have interconnected. These include Martin County Utilities, which has interconnects between most of its treatment plants, and St. Lucie County Utilities, which uses interconnects to facilitate bulk purchases and transfer of water. It is anticipated that the water treatment plants in the region will continue interconnecting for greater flexibility and fire safety.

Recommendations

6.1 Encourage potable water interconnects

Total Costs of Projects / Recommendations

Any costs for projects/recommendations associated with utility interconnects are budgeted under Recommendation 40 of the LEC section.

Quantity of Water Potentially Available

See **Table 7** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

The SFWMD and water treatment utilities will fund the utility interconnects recommendation.

Implementing Agency

The SFWMD and water treatment utilities will implement the utility interconnects recommendation.

Summary of Changes / Implementation from the Previous Work Program

Encourage Potable Water Interconnects. This activity is an ongoing effort.

7. Related Implementation Strategies

Definition / Discussion

The UEC Water Supply Plan Advisory Committee recommended five related strategies to implement the UEC Water Supply Plan. Most of these strategies involve incorporating modeling assumptions, used in development of this plan, into the Consumptive Use Permitting (CUP) Program through a subsequent rulemaking effort.

Recommendations

7.1 Incorporate the assumptions and criteria of the UEC Water Supply Plan into the Consumptive Use Permitting (CUP) Program
7.2 Continue coordination of UEC Water Supply Plan implementation
7.3 Wetland Drawdown Study – complete. See Districtwide Water Resource Development Efforts
7.4 Wetland mitigation should remain in the region
7.5 Fund implementation of the UEC Water Supply Plan

Total Costs of Projects / Recommendations

The remaining costs associated with implementing the related implementation strategies of the UEC Water Supply Plan are incorporated into either the Districtwide Efforts or the LEC Regional Water Supply Plan recommendations.

Quantity of Water Potentially Available

These recommendations will not directly result in any water becoming available.

Funding Source

The SFWMD will fund the implementation recommendations.

Implementing Agency

The SFWMD will implement these recommendations.

Summary of Changes / Implementation from the Previous Work Program

Incorporate the Assumptions and Criteria of the UEC Water Supply Plan into the SFWMD's Consumptive Use Permitting (CUP) Program. The SFWMD has initiated rulemaking in 26 subject matters in the CUP Program and other components of the SFWMD's overall water responsibilities. White papers and preliminary rule drafts have been developed for several of the subjects. Rules adopted by the Governing Board in FY 2002 and 2003 have incorporated these assumptions into the SFWMD's rules.

Continue Coordination of UEC Water Supply Plan Implementation. As reported in last year's Five-Year Water Resource Development Work Program, coordination of the *Upper East Coast Water Supply Plan* (SFWMD, 1998a) implementation with local governments and utilities continues with many activities including comprehensive plan reviews, CUP activities and the Alternative Water Supply (AWS) Funding Program. A memorandum of understanding has been signed with the SJRWMD formalizing coordination efforts in the areas of water resource investigations, water supply planning and development, water use regulation and water shortage management. The SJRWMD and the SFWMD share information on a regular basis. Coordination of the UEC Water Supply Plan implementation with the Indian River Lagoon Feasibility Study and other SFWMD regional planning and development efforts continues through SFWMD forums and utilization of the same District staff. The 5-year update to the UEC Water Supply Plan was initiated in FY 2003. The update is scheduled for completion in June 2004.

Wetland Drawdown Study. The Wetland Drawdown Study has been completed. The project is discussed in the Districtwide Water Resource Development Efforts section of this document.

Wetland Mitigation in the UEC Planning Area Should Remain in the Region. Four mitigation banks are located in St. Lucie County: Treasure Coast, Platt's Creek, Bear Point and Bluefield Ranch. These have a total of over 5,900 acres. One bank has been established in Martin County, R.G. Reserve, totaling 640 acres.

Summary of UEC Water Supply Plan Costs and Schedules

Table 6. Summary of Estimated Schedule and SFWMD Costs for Water Resource Development Recommendations in the UEC Water Supply Plan

Water Source Options and Recommendations		Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon UEC Plan Update in 2004											
		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–FY 2008	
		$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Water Source Option 1: Surface Water Storage													
1.1	Complete the Indian River Lagoon Feasibility Study	Incorporated into the Indian River Lagoon Project, CERP Upper East Coast (**Table 3**)											
1.2	Identify, design and construct other regional attenuation facilities	Ongoing with no funds or FTEs committed at this time											
1.3	Support the design and construction of the Ten Mile Creek Project	See **Table 2** in the Districtwide Water Resource Development Efforts section (Critical Projects)											
1.4	Develop and adopt MFLs for the St. Lucie Estuary	Complete										0	0.00
1.5	Increase storage and conveyance in C canals (C-23 Canal Dredging)	0	0.00	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0	0.00
	Subtotal	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
Water Source Option 2: Aquifer Storage and Recovery													
2.1	Evaluate colocating ASR and surface water storage	Incorporated into the ASR pilot projects listed under CERP (**Table 3**)											
2.2	Evaluate canal water quality for surface water ASR												
2.3	Evaluate reactivating the Demonstration Project for Lake Okeechobee ASR	Currently not feasible; incorporated into the ASR pilot projects for further evaluation listed under CERP (**Table 3**)											
2.4	Explore rule changes to facilitate untreated water ASR	Incorporated into the ASR pilot projects listed under CERP (**Table 3**)											
2.5	Develop rules to address conflicts with ASR and the Floridan Aquifer	Incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**)											
2.6	Evaluate injecting excess surface water into the Floridan Aquifer for recharge	Incorporated into Recommendations 1.2 and 3.1 of the KB Water Supply Plan (**Table 4**)											
2.7	Evaluate injecting surface water to increase freshwater head	Incorporated into Recommendation 1 of the LEC Regional Water Supply Plan (**Table 10)**											
Water Source Option 3: Floridan Aquifer													
3.1	Remove the Floridan Aquifer from the MFL priority list	Complete											
3.2	Develop and implement a Floridan Aquifer monitoring network	125	0.40	125	0.40	125	0.40	125	0.40	125	0.40	625	2.00
3.3	Develop incentives for a Floridan Aquifer well abandonment program	9	0.00	Ongoing with no funds or FTEs committed at this time								9	0.00
3.4	Evaluate desalination concentrate disposal options	Pending FDEP rule changes											
3.5	Evaluate recharge areas in central Florida	Incorporated into Recommendations 1.1 and 1.2 of the KB Water Supply Plan (**Table 4**)											

Water Source Options and Recommendations	Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon UEC Plan Update in 2004											
	FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–FY 2008	
	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Subtotal	**134**	**0.40**	**125**	**0.40**	**125**	**0.40**	**125**	**0.40**	**125**	**0.40**	**634**	**2.00**

Table 6. Summary of Estimated Schedule and SFWMD Costs for Water Resource Development Recommendations in the UEC Water Supply Plan (Continued)

	Water Source Options and Recommendations	Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon UEC Plan Update in 2004											
		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–FY 2008	
		$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Water Source Option 4: Conservation													
4.1	Promote water conservation	See the Districtwide Water Resource Development Efforts section (**Table 1**)											
4.2	Provide cost-share funding for MILs												
Water Source Option 5: Wastewater Reuse													
5.1	Develop incentives for reuse	Being funded through Alternative Water Supply Grant Funds											
5.2	Evaluate reclaimed water system interconnects	Incorporated into Recommendation 43 of the LEC Regional Water Supply Plan (**Table 10**)											
5.3	Adopt rules related to wastewater reuse	Incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**)											
5.4	Assist with reclaimed water projects involving groundwater recharge	Incorporated into Recommendation 44 of the LEC Regional Water Supply Plan (**Table 10**)											
5.5	Work with the FDEP on reclaimed water quality standards for groundwater recharge												
	Subtotal	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
Water Source Option 6: Utility Interconnects													
6.1	Encourage potable water interconnects	Ongoing											
Water Source Option 7: Related Implementation Strategies													
7.1	Incorporate the assumptions and criteria of the UEC Water Supply Plan into the CUP Program	Incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**)											
7.2	Continue coordination of UEC Water Supply Plan implementation	Ongoing										0	0.00
7.3	Wetland Drawdown Study	Complete - See the Districtwide Water Resource Development Efforts section (**Table 1**)											
7.4	Wetland mitigation should remain in the region	Complete										0	0.00
7.5	Fund implementation of the UEC Water Supply Plan	Ongoing										0	0.00
	Subtotal	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
	TOTAL	**134**	**0.40**	**125**	**0.40**	**125**	**0.40**	**125**	**0.40**	**125**	**0.40**	**634**	**2.00**

Summary of the Quantity of Water to Be Made Available by Implementation of the UEC Water Supply Plan

Table 7. Water Made Available Through Implementation of the UEC Water Supply Plan in FY 2004 and by FY 2008

Recommendation		Estimated Water Made Available (MGD)	
		In FY'04	By FY'08
1	**Surface Water Storage**		
1.1	Complete the Indian River Lagoon Restoration Feasibility Study (CERP)	0.00	0.00
1.2	Identify, Design and Construct other Regional Attenuation Facilities (CERP)	0.00	0.00
1.3	Support the Design and Construction of the Ten Mile Creek Critical Restoration Project	0.00	0.00
1.4	Develop and Adopt MFL Criteria for the St. Lucie Estuary	0.00	0.00
1.5	Evaluate Increasing Storage and Conveyance in C-Canals (C-23)	0.00	0.00
2	**Aquifer Storage and Recovery**		
2.1	Evaluate the Potential of Colocating ASR and Surface Water Storage (CERP)	0.00	0.00
2.2	Evaluate Surface Water Quality for ASR (CERP)	0.00	0.00
2.3	Evaluate the Potential of Reactivating the Lake Okeechobee ASR Demonstration Project (CERP)	0.00	0.00
2.4	Explore Rule changes in the UIC Program	0.00	0.00
2.5	Develop Rules to Address Potential Conflicts between ASR and Floridan Aquifer Use	0.00	0.00
2.6	Evaluate the Feasibility of Injecting Excess Surface Water into the Floridan Aquifer (CERP)	0.00	0.00
2.7	Evaluate Injection of Excess Surface Water to Increase Coastal Head (CERP)	0.00	0.00
3	**Floridan Aquifer**		
3.1	Remove Floridan Aquifer from the MFL Priority List	0.00	0.00
3.2	Develop a Regional Floridan Aquifer Monitoring Network	0.00	0.00
3.3	Develop Options for a Volunteer Well Abandonment Program	0.00	0.00
3.4	Explore Desalination Concentrate Disposal Options	0.00	0.00
3.5	Evaluate Floridan Aquifer Recharge Areas	0.00	0.00
4	**Conservation**		
4.1	Promote Water Conservation (Agricultural Irrigation System Conversion and Urban)	10.68	13.00
4.2	Provide cost-share funding for Mobile Irrigation Labs	8.60	43.00
5	**Wastewater Reuse**		
5.1	Develop Incentives for Reuse	2.00	7.00
5.2	Encourage Utilities to Evaluate Reclaimed Water Interconnects	0.00	0.00
5.3	Adopt Rules Implementing Wastewater Reuse and Back-up Sources	0.00	0.00
5.4	Provide Assistance for Reclaimed Water Projects Involving Recharge	0.00	0.00
5.5	Develop Reclaimed Water Quality Standards for Groundwater Recharge	0.00	0.00
6	**Utility Interconnects**		
6.1	Encourage Potable Water Interconnects between Utilities	0.00	0.00
7	**Related Implementation Strategies**	0.00	0.00
7.1	Incorporate the UEC Water Supply Planning Criteria into the CUP Process	0.00	0.00
7.2	Continue Coordination of the UEC Water Supply Plan with Other Agencies and Projects	0.00	0.00
7.3	Continue the Ongoing Districtwide Wetland Drawdown Study	0.00	0.00
7.4	Maintain Wetland Mitigation in the UEC Planning Area within the Region	0.00	0.00
7.5	Fund Implementation	0.00	0.00
	TOTAL	**21.28**	**63.00**

2000 Lower West Coast Water Supply Plan

Plan Organization

Water resource development options for the Lower West Coast (LWC) Planning Area are grouped based on water source options that were identified to address key regional issues:

1. Conservation
2. Groundwater resources
3. Reclaimed water
4. Regional irrigation distribution system
5. Seawater
6. Storage
7. Surface water
8. Related implementation strategies

Information Provided

The summary of each of the eight water resource development options includes a description, a list of recommendations, funding sources, implementing agencies, costs to SFWMD and estimates of total District staff time required in FTEs to implement the option. The schedule and costs to implement the recommendations in the *Lower West Coast Water Supply Plan* (SFWMD, 2000c) over the FY 2004 through FY 2008 period are summarized in **Table 8** at the end of this section. In addition, estimates are provided of the amount of water that will be made available (to the extent that can be determined) for each recommendation in **Table 9**.

The water resource development projects are listed to correspond with the options and recommendations in the LWC Water Supply Plan. For each option, a description is provided of changes in the plan scope or implementation that has occurred since the last *Five-Year Water Resource Development Work Program* (SFWMD, 2003) was published.

Water Resource Development Options and Recommendations

1. Conservation

Description / Discussion

This option requires implementation of water conservation measures that address demand reduction, including practices that achieve long-term permanent reductions in water use rates. The SFWMD has amended its water use permitting rules to incorporate specific,

mandatory water conservation requirements for each use type. Use types include public water supplies, commercial/industrial users, landscape and golf course users and agricultural users. Another conservation measure is the implementation of the Districtwide Comprehensive Water Conservation Program. As stated earlier, program costs are being distributed across the four planning areas. A more detailed description of this program is provided in the Districtwide Water Resource Development Efforts section of this document.

Mobile irrigation labs (MILs) provide a cost-effective means to promote more efficient use of water among urban and agricultural water users. The SFWMD advocates maintaining the existing three and adding one more MIL in the LWC Planning Area through identification of dedicated funding sources to replace current SFWMD funding.

Recommendations

1.1 Develop a conservation program
1.2 Maintain and add MILs

Total Costs of Projects / Recommendations

The total costs of the Comprehensive Water Conservation Program and MILs are discussed in the Districtwide Water Resource Development Efforts section of this document.

Quantity of Water Potentially Available

See **Table 9** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

The SFWMD and local sponsors are funding the Comprehensive Water Conservation Program. The MILs are a component of the SFWMD's Comprehensive Water Conservation Program and are funded in FY 2003 by the SFWMD, the UDSA-NRCS, the USDA and the Florida Department of Agriculture and Consumer Services (FDACS).

Implementing Agencies

The SFWMD and local sponsors are implementing the Comprehensive Water Conservation Program. The SFWMD, county Soil and Water Conservation Districts and the FDACS are implementing the MILs in the LWC Planning Area.

Summary of Changes / Implementation from the Previous Work Program

Year Round Mandatory Water Conservation Measures. In 2003, the SFWMD adopted year round mandatory water conservation measures for landscape irrigation (Rule 40E-24) for all of Lee, Collier and applicable portions of Charlotte County. The purpose of the mandatory conservation measures is to ensure the long-term sustainability of the water

resources in these counties, which make up a significant portion of the LWC Planning Area. Also, it is the intent of these measures to increase water use efficiency and curtail wasteful water use practices. Implementation and enforcement of this program is ongoing; public awareness is being expanded in a public information campaign.

Comprehensive Water Conservation Program. The implementation of the Comprehensive Water Conservation Program is discussed in the Districtwide Water Resource Development Efforts section of this document.

Mobile Irrigation Labs (MILs). In FY 2003, $211,000 was spent in the LWC Planning Area on three MILs, two are urban and one is agricultural. This includes an urban MIL that is funded through the Big Cypress Basin. The MILs have been incorporated into the Comprehensive Water Conservation Program and are discussed in more detail in the Districtwide Water Resource Development Efforts section of this document.

The urban labs educate property owners/operators in irrigation efficiency, system design needs and irrigation scheduling. Each urban MIL completes about 140 evaluations per year, with potential water savings of 30 million gallons of water per year and an associated reduction in lawn chemicals and fertilizers leaving the site as runoff. The agricultural labs performed 110 evaluations in FY 2003 and saved 230 million gallons of water within the year.

2. Groundwater Resources

Description / Discussion

Three major aquifer systems exist within the LWC Planning Area. These aquifers are identified as the Surficial Aquifer System (SAS), the Intermediate Aquifer System (IAS) and the Floridan Aquifer System (FAS).

The SAS consists of two aquifers in the LWC Planning Area, the water table and the lower Tamiami. These aquifers are easily recharged from the surface and are separated by leaky confining units over the majority of the LWC Planning Area. Wellfields using these aquifers are typically limited by the rate of recharge and water movement in the aquifer, environmental impacts, proximity to contamination sources, saltwater intrusion and other existing legal users in the area.

The IAS consists of five zones of alternating producing and confining units, with the producing zones being the Sandstone and Mid-Hawthorn Aquifers. Increases in production from the IAS beyond existing demands may be limited in some areas due to potential affects on existing legal users and the productivity of the aquifer. In some areas, this may require modifications to wellfield configurations and pumping regimes.

The FAS underlies all of Florida. It is the principal source of water in central Florida, but it only yields nonpotable water throughout most of the LWC Planning Area. Water must

be treated by desalination to produce a potable product. The most productive zones in the FAS in the LWC Planning Area are the lower Hawthorn, Suwannee and Avon Park Aquifers.

Recommendations

2.1.1 Maintain and expand the SAS monitoring program
2.1.2 Incorporate SAS concepts and criteria of the LWC Water Supply Plan into the Consumptive Use Permitting (CUP) Program
2.1.3 Develop and utilize SAS models
2.2.1 Maintain and expand the IAS monitoring program
2.2.2 Incorporate IAS concepts and criteria of the LWC Water Supply Plan into the CUP Program
2.2.3 Develop and utilize IAS models
2.3.1 Develop a model to evaluate FAS use, aquifer storage and recovery (ASR) storage and water quality
2.3.2 Expand the FAS groundwater monitoring network
2.3.3 Develop and recognize FAS data partnerships
2.3.4 Continue government cooperation to explore alternative desalination concentration disposal options

Total Costs of Projects / Recommendations

Incorporation of SAS and IAS concepts into the CUP Program (Recommendations 2.1.2 and 2.2.2) is being implemented through Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**). The development of the model that will be used to evaluate FAS use, ASR storage and water quality (Recommendation 2.3.1) is reflected in **Table 8** and has also been incorporated into the Aquifer Storage and Recovery Regional Study that is part of the CERP (**Table 3**). The total costs of the remaining projects/recommendations associated with the groundwater resources water source option are approximately $1.44 million, with 8.30 FTEs, for the period from FY 2004 through FY 2008.

Quantity of Water Potentially Available

See **Table 9** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

The SFWMD and local sponsors will fund these projects.

Implementing Agency

The SFWMD and the USGS will implement these projects.

Summary of Changes / Implementation from the Previous Work Program

Maintain and Expand the SAS and IAS Monitoring Programs. The SFWMD and the USGS have worked cooperatively to improve the coverage of the real time aquifer water level monitoring network. Improvements to the non-Floridan groundwater monitoring network have taken place over the past few years. Since 2000, real time water level monitoring data network collection platforms were established on 13 existing non-Floridan wells. These wells provide real time data to the USGS for use with their online, real time groundwater conditions map. In addition, 41 well sites were converted with recorders as follows: 19 recorders were upgraded with transducers that allow digital recording and 22 wells were converted from monthly tape measurements to recorders. In FY 2003, an additional 19 well sites were fitted with USGS recorders: three in Collier County, six in Lee County and ten in Hendry County.

SAS and IAS Concepts and Criteria. The SAS and IAS concepts and criteria used in the LWC Water Supply Plan should be incorporated into the SFWMD's CUP Program and other components of the SFWMD's overall water supply management responsibilities through rulemaking, such as minimum flows and levels (MFLs), coastal saltwater intrusion prevention, wetland protection, aquifer protection from excessive drawdowns, aquifer monitoring and protection from contamination.

SFWMD has initiated numerous rulemaking efforts consistent with the regional water supply plans. The initial group of proposed rules became known as the "A List" rules became effective in August 2002. The "B List" consumptive use permitting rules became effective in September 2003.

Develop and Utilize SAS and IAS Models. A composite groundwater model for Collier, Lee and Hendry Counties is under construction. In late 2002, SFWMD staff determined that the Regional Simulation Model (RSM) for the SAS and IAS would be utilized for the LWC Water Supply Plan. Currently, this model is also being developed for the CERP Southwest Florida Feasibility Study. The model has a variable grid. Modifications to the RSM are planned for use in the 2005 LWC Regional Supply Plan update. In addition, the SFWMD is developing a separate Modflow Model for the Mid-Hawthorne Aquifer. In the future, this may be incorporated into the RSM, but will not be available by the 2005 LWC Water Supply Plan update process.

Develop a Model to Evaluate FAS Use, ASR Storage and Water Quality. Data collection has been initiated for development of a FAS model. Several meetings were held in 2002 to discuss the need for and timing of development of a FAS model. In September 2003, a contract was initiated to develop a model to be used in the LWC Water Supply Plan update due in 2005. The model is a comprehensive flow model for the LWC Floridan Aquifer System, and will be capable of simulating movement of salt water towards production wells. The results of this FAS modeling effort will be integrated into the CERP Aquifer Storage and Recovery Study, and further model development would then follow.

Potentiometric Mapping Project for IAS. A study to define and delineate the water table, lower Tamiami, Sandstone and Mid-Hawthorn Aquifers was completed to provide

greater interpretation of the Lower West Coast's regional hydrogeology. The purpose of the study, initiated in late 2001, was to collect available hydrogeologic, lithologic, geophysical and other related data pertaining to the LWC aquifers and update the interpretation of these data. Other specific objectives of the study included the production of isopach and top of aquifer contour maps for each aquifer, along with potentiometric surface maps of each aquifer and a characterization of the aquifer properties. The tasks were completed in 2003 and deliverables were reviewed and modified for incorporation into the RSM for the Southwest Florida Feasibility Study.

Expand the FAS Groundwater Monitoring Network. The water quality and water level monitoring network is being enhanced with installation of real time data loggers that will record water levels on an hourly basis. The seven FAS wells that were automated and placed online with recorders in 2002 are being monitored. In 2004, three remaining recorders will be installed and five additional viable Floridan well sites will be identified for recorder installation. Data from these recorders will be utilized to calibrate the LWC Floridan Aquifer inset model for the 2010 LWC Water Supply Plan update. Floridan exploratory well construction and testing documents have been finalized for well sites in La Belle and Immokalee, as well as other sites in Collier and Hendry Counties.

Develop and Recognize FAS Data Partnerships. The SFWMD has funded and is currently in the process of developing a comprehensive flow model for the Floridan Aquifer System.

Continue Government Cooperation to Explore Alternative Desalination Concentration Disposal Options. The SFWMD participated in a workshop with the SJRWMD, the FDEP and the USEPA concerning options for disposal of concentrate from desalination treatment facilities. Potential methods of disposal include deep well injection, surface water discharge and blending with reclaimed water. The reclassification of concentrate to something other than industrial waste would reduce construction costs associated with deep well injection. For surface water discharges, the FDEP indicated a desire to assist applicants in characterizing water quality in receiving bodies and of the concentrate (based on source quality and treatment method), and applying an up front screening level process to identify potential concerns, including toxicity. Reclassifying concentrate to something other than industrial waste was discussed during the 2000 legislative session, but no legislative changes have occurred to date related to this issue.

3. Reclaimed Water

Description / Discussion

Reclaimed water is water that has flowed out of a domestic wastewater treatment facility, received at least secondary treatment and basic disinfection, and is reused for a beneficial purpose. Reuse is the application of reclaimed water, in compliance with the FDEP and SFWMD rules, for a beneficial purpose. Potential uses of reclaimed water include landscape and agricultural irrigation, groundwater recharge, industrial uses and

environmental enhancement. Reclaimed water has played a significant role in meeting the water supply needs of the LWC, and this is expected to continue.

Recommendations

The recommendation listed under the Regional Irrigation Distribution System water source option employs the use of reclaimed water. The reclaimed water recommendation discussion follows.

Quantity of Water Potentially Available

See **Table 9** for the quantity of water potentially available in FY 2004 and by FY 2008.

Summary of Changes / Implementation from the Previous Work Program

The use of reclaimed water remained constant in the LWC Planning Area from 2001 to 2002 with about 62 MGD being used. Fiscal Year 2003 reclaimed water use data will be available in June 2004. Of the 22 wastewater facilities in the planning area, 21 are reclaiming water. Over 90 percent of the treated wastewater is being reused for irrigation of residential lots, golf courses and other green spaces.

4. Regional Irrigation Distribution System

Description / Discussion

The construction and operation of a regional irrigation distribution system will enable water to be transferred from areas of surplus to areas of deficit to fulfill urban irrigation needs. This regional system could conserve the fresh groundwater sources, while maximizing the use of reclaimed water that would have otherwise been discharged to surface water or deep well injected and lost from the inventory. Storage, primarily through ASR, will be a key component to bridge the gap between the seasonal and geographic relationships of available supplies and demands. This system would make irrigation water available for local supply entities/utilities to withdraw from for distribution to meet their individual needs. This system could have many different configurations, including one large regional system, several subregional systems or on a utility-by-utility basis.

Recommendations

4.1 Conduct and implement a regional irrigation distribution system study

Total Costs of Projects / Recommendations

The total cost of conducting and implementing a regional irrigation distribution system study is approximately $3.3 million with 2.25 FTEs, for the period of FY 2004 through FY 2008.

Quantity of Water Potentially Available

See **Table 9** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

The SFWMD, the FDEP, the USEPA, local governments, water users and/or utilities will fund the study.

Implementing Agency

The SFWMD will conduct a regional irrigation distribution system study.

Summary of Changes / Implementation from the Previous Work Program

Regional Irrigation Distribution System Study. A contract was awarded to conduct a feasibility analysis and master plan for the construction and operation of a regional irrigation distribution system in the urban areas of Lee and Collier Counties. The Regional Irrigation Distribution System (RIDS) study consists of a distribution system that would make irrigation water available to local supply entities and utilities for distribution to individual users. Several local entities have committed to co-funding this project: the cities of Cape Coral, Naples and Fort Myers; Lee and Collier Counties; Bonita Springs Utilities; Resource Conservation Systems; and Florida Water Services.

Phase 1 of the study was completed in December of 2001 and included: a facilities inventory, a forecast of urban irrigation water demands, delineation of potential urban irrigation water sources, supply and demand analysis, storage and distribution options, cost analysis and funding sources and options. Overall findings showed that a combined future flow of 213 MGD (projections of 348 MGD urban irrigation for Lee and Collier Counties by the year 2020) could be provided via reclaimed wastewater from municipal wastewater treatment plants, reclaimed water ASR, surface water, surface water ASR and groundwater withdrawals adjacent to surface water sources, such as mining pits. Unit cost ranges from $.67 to $1.03 per 1,000 gallons. Both grant and funding options are available. The study determined that individual interlocal agreements on a project-by-project basis would work best for the stakeholders.

The RIDS study concluded: “Benefits and incentives for the RIDS program are very positive in terms of additional water resources in a high growth area, such as the Lower West Coast of Florida. Overall, the RIDS optimizes existing reclaimed water supplies, maximizes seasonally available surface water, diversifies supply sources, potentially reduces water shortage declarations, offsets potable water usage for irrigation purposes, reduces wastewater disposal volumes and offsets future potential groundwater withdrawals.”

Phase 2, a subregional study, will be completed in December 2004. An amendment to the contract will be presented to the SFWMD’s Governing Board in November 2004 for approval. The purpose of this amendment is to add a subregion to the study. Lee County and

the City of Ft. Myers will participate in the subregional analysis, which will further study the preferred alternative from the RIDS master plan to determine pipeline routes, pipe and pump sizes, specific storage locations, materials, detailed costing, detailed scheduling and a focused funding strategy. Future project activities will be Phase 3, Engineering Design and Phase 4, Construction.

5. Seawater

Description / Discussion

This option involves using seawater from the Gulf of Mexico as a raw water source. The Gulf of Mexico appears to be an unlimited source of water from a quantity perspective; however, removal of salts is required prior to potable or irrigation uses. A desalination treatment technology would be needed, such as distillation, reverse osmosis or electrodialysis reversal.

Recommendations

At the time the *Lower West Coast Water Supply Plan* was published (in the year 2000), it was determined that seawater was a potential source, but was not cost-effective. Therefore, no recommendations were made within the plan for this water source option. Since then, technological improvements have made seawater desalination more affordable. The SFWMD conducted a feasibility study of colocating reverse osmosis plants with electric generation facilities under the LEC Regional Water Supply Plan implementation (Recommendation 42 under the Other Water Resource Projects). This feasibility study also benefited the other planning areas, including the Lower West Coast.

Total Costs of Projects / Recommendations

See Recommendation 42 under Other Water Resource Projects in the LEC section.

Quantity of Water Potentially Available

See **Table 9** for the quantity of water potentially available in FY 2004 and by FY 2008.

Summary of Changes / Implementation from the Previous Work Program

Other Water Resource Projects – Seawater Desalination. Technological improvements have made seawater desalination more affordable. Colocation with power plants reduces cost by sharing the cost of intake and discharge facilities, providing more desirable sources of water and providing sufficient cooling water discharges to dilute the reverse osmosis concentrate.

The SFWMD hired a consultant to conduct a feasibility study of colocating seawater reverse osmosis treatment systems with power plants. The purpose of the study was to

provide order of magnitude cost estimates for representative sites within the SFWMD. Phase 1 of this feasibility study was completed in March 2002. The study recommended two "desirable" technically feasible Florida Power & Light (FPL) sites for a more detailed evaluation and cost analysis, Port Everglades in Broward County and Ft. Myers in Lee County.

In 2003, it was agreed that Lee County Utilities would purchase the land for the reverse osmosis plant and easements for conduits that will convey influent and effluent water. The land deal will include reverter and specific use clauses. Lee County Utilities agreed to use FPL as its sole provider of electricity and will pay applicable rates from time to time. Based on the study, the capital cost of the colocated facility located at Ft. Myers would be $17.3 million, yielding a unit cost of $1.33 per 1,000 gallons for a 10 MGD facility and the capital cost of the 25 MGD facility would be $35.5 million, yielding a unit cost of $1.16 per 1,000 gallons.

6. Storage

Description / Discussion

Three types of potential storage options were identified in the LWC Water Supply Plan. These types are ASR, regional retention and reservoirs.

Aquifer Storage and Recovery (ASR) is the underground storage of injected water into an acceptable aquifer (typically the FAS in southwestern Florida) during times when water is available, and the subsequent recovery of this water during high demand periods. In other words, the aquifer acts as an underground reservoir for the injected water, reducing water loss to evaporation. Current regulations require injected water to meet drinking water standards when the receiving aquifer is classified as a drinking water aquifer, unless an aquifer exemption is obtained from the USEPA. Obtaining an aquifer exemption is a rigorous process and few have been approved. Although the SFWMD will forgo seeking a variance until studies regarding pathogen die-off have been completed, the USEPA has indicated that a flexible assessment approach will be applied for systems that meet all drinking water standards except fecal coliform.

Under the regional and local retention option, opportunities are examined to increase water storage through manipulation and modification of the drainage system, while still maintaining an appropriate level of flood protection. Much of the LWC Planning Area has been drained to support agricultural and urban development. This has resulted in lowered groundwater tables that may impact natural systems, as well as water availability in these areas. The analysis in the *1994 Lower West Coast Water Supply Plan* (SFWMD, 1994) concluded that modifying water levels in existing drainage canals and eliminating unnecessary canals can significantly elevate groundwater levels in the Big Cypress Basin. Members of the LWC Water Supply Plan Advisory Committee stated that the work completed by the Big Cypress Basin has successfully improved their canal system to increase groundwater levels, resulting in less frequent irrigation demands.

The use of reservoirs involves the capture and storage of excess surface water during rainy periods and subsequent release during drier periods for environmental and human uses. Regionally, surface water storage could be used to attenuate freshwater flows to the Caloosahatchee Estuary and other estuarine water bodies during rainy periods and meet minimum flows during drier periods. In addition, these facilities could increase surface water availability for current and projected uses, and decrease the demand on aquifer systems. However, evaporative and seepage losses could significantly affect water availability.

Recommendations

6.1.1 Continue government cooperation to make rule changes to the Underground Injection Control (UIC) Program
6.1.2 Develop CUP Program rules to address the use of the FAS for ASR
6.2.1 Modify regional and local retention systems/operations

Total Costs of Projects / Recommendations

The development of CUP rules to address the use of the FAS for ASR has been incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**).

Quantity of Water Potentially Available

See **Table 9** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

The SFWMD, local governments and local drainage districts will fund this recommendation.

Implementing Agency

The SFWMD, local governments and local drainage districts will implement this recommendation.

Summary of Changes / Implementation from the Previous Work Program

Government Cooperation to Make Rule Changes to the Underground Injection Control Program. The SFWMD would continue working with other government entities, including the legislature, Congress, USEPA and FDEP, to explore rule changes to the federal and state Underground Injection Control (UIC) Program to allow for injection of untreated or partially treated groundwater or surface water for aquifer storage and recovery. The Fate of Microorganisms in Aquifers Study is being conducted in cooperation with the Southwest Florida Water Management District (SWFWMD) to better understand variables that result in pathogen die-off. Results of this study would provide the scientific basis for any change in existing regulations.

Develop CUP Program Rules to Address the Use of the FAS for ASR. The Staffing requirements for the CUP, rulemaking and resource protection projects recommended in all of the regional water supply plans have been incorporated into the LEC Regional Water Supply Plan, Recommendation 40 in **Table 10**.

Modify Regional and Local Retention Systems/Operations. The SFWMD has provided funding to two regional retention projects, the Cape Coral/Gator Slough/Reuse System Enhancement Project and the East County Water Control District Aquifer Recharge Project. The Cape Coral/Gator Slough/Reuse System Enhancement Project will provide an additional 19 MGD of water for their reuse system. The East Water Control District Aquifer Recharge Project will raise water levels in a 9,000-acre watershed. Delays in funding have slowed this project. Work accomplished in the Big Cypress Basin (per the 5-year work plan) includes structure replacements for Golden Gate #1 and Faka Union #5 structures. Design work has been completed for the CR 951 Canal Structure, the Corkscrew Canal Weir #1 and the Henderson Creek Diversion pump system preliminary design. Additionally, the first phase implementation of the CERP Southern Golden Gate Estates Hydrologic Restoration Project has begun. Raising water levels in the Prairie Canal would result in estimated additional groundwater storage of 7,337 acre-feet per year over the 2000 land use base condition.

7. Surface Water

Description / Discussion

This option involves the use of surface water as a supply source. Surface water bodies in the LWC Planning Area include lakes, canals and rivers. Lake Trafford and Lake Hicpochee are the two largest lakes within the LWC Planning Area, but neither is considered a good source of water. The Caloosahatchee River Basin and the associated flows from Lake Okeechobee form the largest source of surface water in the LWC Planning Area. The *Caloosahatchee Water Management Plan* (SFWMD, 2000e) addressed most of the surface water needs in the LWC Planning Area.

Recommendations

7.1 Develop a Caloosahatchee River ASR pilot project
7.2 Implement the C-43 Storage Project
7.3 Complete the Southwest Florida Feasibility Study
7.4 Establish MFLs for the Caloosahatchee River and Estuary
7.5 Implement well abandonment programs
7.6 Analyze saltwater influence
7.7 Continue government cooperation to make rule changes to the UIC Program
7.8 Evaluate the environmental needs of the Southwest Florida Feasibility Study

Total Costs of Projects / Recommendations

The Caloosahatchee River ASR Pilot Project, the C-43 Storage Project and the Southwest Florida Feasibility Study have been incorporated into the CERP (**Table 3**). The well abandonment programs (Recommendation 7.5) have been incorporated into Recommendation 3.3 of the UEC Water Supply Plan (**Table 5**). No other costs are associated with the surface water option.

Quantity of Water Potentially Available

See **Table 9** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Source

The SFWMD and the USACE will cost share Recommendation 7.1, 7.2 and 7.3 as part of the CERP. Landowners and local government will fund well abandonment programs. The SFWMD will fund the analysis of saltwater influence (Recommendation 7.6).

Implementing Agency

The SFWMD and the USACE will implement Recommendation 7.1, 7.2 and 7.3 as part of the CERP. Landowners and local government will implement well abandonment programs. The SFWMD will implement the analysis of saltwater influence (Recommendation 7.6).

Summary of Changes / Implementation from the Previous Work Program

Caloosahatchee River ASR Pilot Project. The SFWMD completed a draft Project Management Plan for the Caloosahatchee River ASR Pilot Project in September 2001. The purpose of the Project Management Plan was to establish the scope, define a schedule and determine the costs associated with conducting the project. Aquifer storage and recovery wells are proposed in order to maximize the benefits associated with the Caloosahatchee River Storage Reservoir. A pilot project for these wells was needed to identify the most suitable sites for the ASR wells in the vicinity of the reservoir, and to determine the optimum configuration of those wells. The pilot project provided information regarding the characteristics of the aquifer system within the Caloosahatchee River Basin, as well as determined the hydrogeological and geotechnical characteristics of the upper Floridan Aquifer. The pilot project also determined the specific water quality characteristics of waters to be injected, the specific water quality characteristics and the amount of water recovered from the aquifer and the water quality characteristics of water within the receiving aquifer.

C-43 Basin Storage Project. The C-43 Basin Storage Project has been divided into two initiatives: the C-43 Storage Reservoir and the C-43 ASR Project. A Project Management Plan for the C-43 Basin Storage Reservoir was completed in February 2002. The C-43 ASR Project schedule has been postponed for a start date of 2009. A Project

Implementation Report is now underway, with the draft scheduled for completion by the end of 2003.

This project is the first part of the C-43 Basin Storage Reservoir and ASR component. The project includes an above ground reservoir with a total storage capacity of approximately 160,000 acre-feet located in the C-43 Basin in Hendry, Glades or Lee Counties. The initial design of the reservoir assumed 20,000 acres with water levels fluctuating up to 8 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design. The purpose of the project is to capture C-43 Basin runoff and releases from Lake Okeechobee. The reservoir will be designed to provide environmental water supply deliveries to the Caloosahatchee Estuary and to reduce salinity and nutrient impacts of runoff to the estuary.

Establishment of MFLs for the Caloosahatchee River and Estuary. This recommendation is to establish MFLs for the Caloosahatchee River and Estuary by December 2000 in accordance with Section 373.042, F.S. The MFLs for the Caloosahatchee River and Estuary and LWC aquifer system (except for the water table aquifer and the Floridan Aquifer) were adopted by the SFWMD's Governing Board in March 2001 and became effective in September 2001. This final rule became effective in September 2001 and was incorporated into Chapter 40.E.8, F.A.C. This rule included flow criteria for S-79 and salinity criteria in the vicinity of the vegetation bed. A draft status update report titled, *Technical Documentation to Support Development of Minimum Flows and Levels for the Caloosahatchee River and Estuary* was prepared by the SFWMD in 2003.

Analyze Saltwater Influence. Saline water has been a recurring problem for the potable water intakes in the Caloosahatchee River. The potable water intakes are located approximately one mile upstream of Structure S-79. During extended periods of low flow, the chloride content of the shallow water increases well beyond the recommended limit of 250 milligrams per liter for drinking water. The District will coordinate additional analysis of the saltwater influence problem at the S-79 Structure. When saltwater intrudes up the Caloosahatchee River to the potable water intakes, releases of water from Lake Okeechobee are made through Structure S-77. This recommendation involves staff support and coordination only. This recommendation also corresponds to the LEC Regional Water Supply Plan, Recommendation 14.

Government Cooperation to Make Rule Changes to the UIC Program. The SFWMD will continue working with other government entities, including the legislature, Congress, USEPA and FDEP, to explore rule changes to the federal and state UIC Program to allow for injection of untreated or partially treated groundwater or surface water ASR. The Fate of Microorganisms in Aquifers Study is being conducted in cooperation with the SWFWMD to better understand variables that result in pathogen die-off. Results of this study would provide the scientific basis for any change in existing regulations.

Southwest Florida Feasibility Study and Evaluation of the Environmental Needs of the Southwest Florida Study. The SFWMD and the USACE approved a Project Management Plan for the Southwest Florida Feasibility Study in January 2002. The purpose of the Project Management Plan was to establish the scope, define a schedule and determine

the costs associated with conducting the Southwest Florida Feasibility Study. The feasibility study will identify water resource related problems and opportunities and provide a framework to address the health of aquatic ecosystems, water flows, water quality, water supply, flood protection, wildlife, biological diversity and natural habitat in southwest Florida.

During 2003, development of the regional hydrologic simulation model continued; four subregional hydrologic models were being developed; a preferred water quality data set was identified and assembled; a comprehensive review of existing water quality reports and studies was done; the first draft of the conceptual ecological models for the study area was completed; conceptual ecological models for each of the major physiographic regions in southwest Florida were produced; and many of the performance measures for the estuarine portion of the study area were completed and accepted by for use in evaluating alternative restoration plans. In addition to the conceptual models, the University of Florida drafted a decision support system involving the creation of species specific models, to be used to screen alternatives and identify a preferred alternative. Via a contract through the USACE, the first draft addressing population projections was accomplished. This information will be finalized in 2004 and used to develop future water demand scenarios for the urban areas within the LWC. In addition, future agricultural demands have been identified.

8. Related Implementation Strategies

Description / Discussion

This section includes those recommended efforts that could not be associated with a specific source option, or apply to several of the options. In general, these recommendations promote consistency by incorporating the concepts and guidelines used as criteria in the LWC Water Supply Plan into the SFWMD's water management programs through rulemaking or other implementation processes.

Recommendations

8.1.1 Incorporate criteria of the LWC Water Supply Plan into the CUP Program
8.1.2 Establish MFLs for the Caloosahatchee River and Estuary and the LWC aquifer systems
8.2 Cooperate with other government entities to accomplish changes in ASR and desalination disposal regulations
8.3 Wetland Drawdown Study – complete. See Districtwide Water Resource Development Efforts.
8.4 Make groundwater models, data and other relative information referenced in the LWC Water Supply Plan available to the public

Total Costs of Projects / Recommendations

The costs of incorporating criteria into the CUP Program have been incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**). No other costs are

associated with the related implementation strategies recommended in the LWC Water Supply Plan.

Quantity of Water Potentially Available

These recommendations will not directly result in any water becoming available.

Funding Source

The SFWMD will fund the related implementation strategies.

Implementing Agency

The SFWMD will implement these strategies.

Summary of Changes / Implementation from the Previous Work Program

Incorporation of Criteria into the CUP Program. The SFWMD has initiated rulemaking in 26 subject matters to incorporate salient portions of all of the water supply plans into the CUP Program and other components of the SFWMD's overall water supply management responsibilities. White papers and preliminary rule drafts have been developed for several of the subjects. The Governing Board adopted the "B List" water use rule revisions, including the ASR rules, in June 2003.

Establishment of MFLs for the Caloosahatchee River and Estuary and LWC Aquifer System. Please refer to 7.4, Establishment of MFLs for the Caloosahatchee River and Estuary, mentioned previously.

Cooperate with Other Government Entities to Accomplish Changes in ASR and Desalination Disposal Regulations. The SFWMD provided technical and legislative support to the FDEP for the sponsorship of Senate Bill 854/House Bill 705 regarding ASR in the 2001 Florida Legislative session. The bill was designed to allow for an exemption to the total coliform drinking water standard for ASR recharge water, provided the applicant can demonstrate die-off of these organisms. The bill did not make it into law. In November 2001, the Executive Director decided to forgo seeking a variance from existing ASR regulatory criteria and determined that ASR pilot projects will comply with applicable regulatory criteria. This decision may be revisited once results from studies being conducted by the SFWMD, the SWFWMD and the SJRWMD regarding pathogen die-off have been completed.

Summary of LWC Water Supply Plan Costs and Schedules

Table 8. Summary of Estimated Schedule and SFWMD Costs for Water Resource Development Recommendations in the LWC Water Supply Plan

Water Source Options and Recommendations		Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon LWC Plan Update in 2005											
		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–FY 2008	
		$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Water Source Option 1: Conservation													
1.1	Develop a conservation program	See Districtwide Water Resource Development Efforts section (**Table 1**)											
1.2	Maintain and add MILs												
Water Source Option 2: Groundwater Resources													
2.1.1	Maintain and expand the SAS monitoring program	60	0.25	70	0.25	70	0.25	70	0.25	70	0.25	340	1.25
2.1.2	Incorporate SAS concepts and criteria into the CUP Program	Incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**)											
2.1.3	Develop and utilize SAS models	Incorporated into Recommendation 2.2.3											
2.2.1	Maintain and expand the IAS monitoring program	60	0.25	70	0.25	70	0.25	70	0.25	70	0.25	340	1.25
2.2.2	Incorporate IAS concepts and criteria into the CUP Program	Incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**).											
2.2.3	Develop and utilize IAS models	0	0.60	0	0.60	100	0.40	100	0.40	100	0.40	300	2.40
2.3.1	Develop a model to evaluate FAS use, ASR storage and water quality	50	0.30	100	0.30	0	0.10	0	0.10	0	0.10	150	0.90
		Also Incorporated into the ASR Regional Study listed under CERP (**Table 3**)											
2.3.2	Expand the FAS groundwater monitoring network	70	0.50	85	0.50	50	0.50	50	0.50	50	0.50	305	2.50
2.3.3	Develop and recognize FAS data partnerships	Ongoing with no funds or FTEs committed at this time											
2.3.4	Continue government cooperation to explore alternative desalination concentration disposal options	Pending FDEP rule changes											
	Subtotal	**240**	**1.90**	**325**	**1.90**	**290**	**1.50**	**290**	**1.50**	**290**	**1.50**	**1,435**	**8.30**
Water Source Option 3: Reclaimed Water													
See Recommendation 4.1													
Water Source Option 4: Regional Irrigation Distribution System													
4.1	Conduct and implement a regional irrigation system study	200	0.25	300	0.50	300	0.50	1,000	0.50	1,500	0.50	3,300	2.25
	Subtotal	**200**	**0.25**	**300**	**0.50**	**300**	**0.50**	**1,000**	**0.50**	**1,500**	**0.50**	**3,300**	**2.25**
Water Source Option 5: Seawater													
See Recommendation 42 of the LEC Regional Water Supply Plan (**Table 10)**													
Water Source Option 6: Storage													
6.1.1	Continue government cooperation to make rule changes to the UIC Program	Incorporated into ASR Pilot Projects listed under CERP (**Table 3**)											
6.1.2	Develop CUP Program rules to address the use of the FAS for ASR	Incorporated into Recommendation 40 of the LEC Regional Water Supply Plan (**Table 10**)											
6.2.1	Modify regional and local retention systems/operations	300	0.10	300	0.10	300	0.10	300	0.10	300	0.10	1,500	0.50
	Subtotal	**300**	**0.10**	**300**	**0.10**	**300**	**0.10**	**300**	**0.10**	**300**	**0.10**	**1,500**	**0.50**

Table 8. Summary of Estimated Schedule and SFWMD Costs for Water Resource Development Recommendations in the LWC Water Supply Plan (Continued)

Water Source Options and Recommendations		Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon LWC Plan Update in 2005											
		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–FY 2008	
		$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Water Source Option 7: Surface Water													
7.1	Develop a Caloosahatchee River ASR pilot project	See CERP subsection (**Table 3**) of the Districtwide Water Resource Development Efforts section											
7.2	Implement the C-43 Storage Project												
7.3	Complete the Southwest Florida Study	See CERP subsection (**Table 3**) of the Districtwide Water Resource Development Efforts section, Reconnaissance, Feasibility, Planning Studies											
7.4	Establish MFLs for the Caloosahatchee River and Estuary	Complete											
7.5	Implement well abandonment programs	See Recommendation 3.3 in the UEC section (**Table 6**)											
7.6	Analyze saltwater influence	Incorporated into Recommendation 2.1.1											
7.7	Continue government cooperation to make rule changes to the UIC Program	Incorporated into ASR Pilot Projects listed under CERP (**Table 3**)											
7.8	Evaluate the environmental needs of the Southwest Florida Study	See CERP subsection (**Table 3**) of the Districtwide Water Resource Development Efforts section, Reconnaissance, Feasibility, Planning Studies											
Water Source Option 8: Related Implementation Strategies													
8.1.1	Incorporate criteria into the CUP Program	See Recommendation 40 in the LEC section (**Table 10**)											
8.1.2	Establish MFLs for the Caloosahatchee River and Estuary and the LWC aquifer systems	Complete											
8.2	Cooperate with other government entities to accomplish changes in ASR and desalination disposal regulations	Incorporated into ASR Pilot Projects listed under CERP (**Table 3**)											
8.3	Wetland Drawdown Study	Complete - See Districtwide Water Resource Development Efforts section (**Table 1**)											
8.4	Make groundwater models, data and other relative information referenced in the LWC Water Supply Plan available to the public	Ongoing											
Subtotal		**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
TOTAL		**740**	**2.25**	**925**	**2.50**	**890**	**2.10**	**1,590**	**2.10**	**2,090**	**2.10**	**6,235**	**11.05**

Summary of the Quantity of Water to Be Made Available by Implementation of the LWC Water Supply Plan

Table 9. Water Made Available Through Implementation of the LWC Water Supply Plan in FY 2004 and by FY 2008

Recommendation		Estimated Water Made Available (MGD)	
		In FY'04	By FY'08
1	**Water Conservation Program**		
1.1	Water Conservation Program	2.40	5.40
1.2	Mobile Irrigation Labs	4.90	24.50
2	**Groundwater Resources**		
2.1.1	SAS Monitoring	0.00	0.00
2.1.2	SAS Rulemaking	0.00	0.00
2.1.3	SAS Modeling	0.00	0.00
2.2.1	IAS Monitoring	0.00	0.00
2.2.2	IAS Rulemaking	0.00	0.00
2.2.3	IAS Modeling	0.00	0.00
2.3.1	FAS Model Development	0.00	0.00
2.3.2	FAS Monitoring	0.00	0.00
2.3.3	FAS Data Partnerships	0.00	0.00
2.3.4	FAS Government Cooperation	0.00	0.00
3	**Reclaimed Water**	62.00	72.00
4	**Regional Irrigation Distribution System**		
4.1	Regional Irrigation Distribution System Study	see 3	see 3
5	**Seawater**	0.00	0.00
6	**Storage**		
6.1.1	ASR Water Quality	0.00	0.00
6.1.2	ASR Rulemaking	0.00	0.00
6.2.1	Regional and Local Retention	0.00	87.70
6.3	Reservoirs	see 7.2	see 7.2
7	**Surface Water**		
7.1	CWMP - Caloosahatchee River ASR Pilot Project	see 7.2	see 7.2
7.2	CWMP - C-43 Storage Project	0.00	0.00
7.3	CWMP - Southwest Florida Study	0.00	0.00
7.4	CWMP - Minimum Flows and Levels	0.00	0.00
7.5	CWMP - Well Abandonment Program	0.00	0.00
7.6	CWMP - Saltwater Influence	0.00	0.00
7.7	CWMP - Permitting Issues Associated with ASRs	0.00	0.00
7.8	Southwest Florida Study	0.00	0.00
8.0	**Related Implementation Strategies**		
8.1.1	Districtwide Rulemaking	0.00	0.00
8.1.2	Minimum Flows and Levels	0.00	0.00
8.2	Government Cooperation	0.00	0.00
8.3	Wetlands Drawdown Study	0.00	0.00
8.4	Public Information	0.00	0.00
	TOTAL	**69.30**	**189.60**

2000 Lower East Coast Regional Water Supply Plan

Plan Organization

Water resource development options for the Lower East Coast (LEC) Planning Area are grouped by the scope and nature of the recommended projects as follows:

1. Ongoing projects from the *Interim Plan for Lower East Coast Regional Water Supply* (LEC Interim Plan) (SFWMD, 1998b)
2. Other federal, state and SFWMD projects
3. The CERP projects
4. Recommendations to the CERP resulting from analysis performed during the LEC regional water supply planning and development process
5. Recommendations to the CERP from the *Caloosahatchee Water Management Plan* (SFWMD, 2000e)
6. Operational recommendations resulting from LEC water supply planning and development process analysis
7. Consumptive Use Permitting (CUP) Program and resource protection projects
8. Other water resource development projects

Information Provided

The summary of each category of recommendations includes a description, a list of recommendations, funding sources, implementing agencies, costs to nonfederal entities (primarily the SFWMD) and estimates of total District staff time required in FTEs to implement the option. The schedule and costs to implement the recommendations in the *Lower East Coast Regional Water Supply Plan* (SFWMD, 2000d) over the next five fiscal years are summarized in **Table 10** at the end of this section. In addition, estimates are provided (to the extent that can be determined) of the amount of water that will be made available for each recommendation in **Table 11**, also at the end of this section.

The water resource development projects are listed to correspond with the numbered recommendations in the LEC Regional Water Supply Plan. For each option, a description is provided of changes in the plan scope or implementation that have occurred during the past year since the last *Five-Year Water Resource Development Work Program* (SFWMD, 2003) was published.

Water Resource Development Options and Recommendations

Ongoing Projects from the LEC Interim Plan

Definition / Discussion

Significant water supply planning and development projects were initiated with the completion of the LEC Interim Plan, which was accepted by the Governing Board in March 1998. A number of these projects involve capital expenditures on the part of the SFWMD or its partners, and must be continued to completion. The majority of these projects will be concluded prior to the next update of the LEC regional water supply plan and the five-year projections reflect this fact.

Recommendations

1. Improve regional saltwater intrusion management
2. Refine the Floridan Aquifer System (FAS) Groundwater Model
3. Develop a Northern Palm Beach County comprehensive water management plan
4. Construct and operate the Eastern Hillsboro Regional Aquifer Storage and Recovery (ASR) Pilot Project
5. Construct and operate the Hillsboro (Site 1) Reservoir Pilot Project
6. Establish Lake Worth Lagoon minimum/maximum flow targets
7. Develop and implement a northern Broward secondary canals recharge network
8. Implement a design study for an interconnected water supply system in southeastern Broward County
9. Evaluate urban environmental enhancement in Broward County
10. Construct the Miami-Dade Water and Sewer Department (WASD) Utility ASR
11. Establish Biscayne Bay minimum and maximum flow targets

Total Costs of Projects / Recommendations

The SFWMD cost of implementing these recommendations for the five-year period from FY 2004 through FY 2008 is contained in **Table 10**.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

- Regional saltwater intrusion management – SFWMD and USGS with local cost sharing by counties
- FAS Groundwater Model – USACE, USGS, SFWMD, water users and local utilities

- Northern Palm Beach County Comprehensive Water Management Plan – City of West Palm Beach, Indian Trail Improvement District, Palm Beach County, SFWMD, CERP and other federal sources
- Eastern Hillsboro Regional ASR Pilot Project – Palm Beach County and SFWMD
- Hillsboro (Site 1) Reservoir Pilot Project – SFWMD
- Lake Worth Lagoon minimum/maximum flow targets – Palm Beach County, USACE and SFWMD
- Northern Broward Secondary Canals Recharge Network – Broward County, City of Fort Lauderdale and SFWMD
- Southeast Broward County Interconnected Water Supply System – the cities of Hallandale Beach, Hollywood and Dania Beach; Broward County; SFWMD; and the Seminole Tribe
- Broward County urban environmental enhancement – Broward County and SFWMD
- Miami-Dade WASD Utility ASR – Miami-Dade WASD, SFWMD and USEPA
- Biscayne Bay minimum and maximum flow targets – Florida Forever Act, National Ocean and Atmosphere Administration, USGS, CERP and specific appropriation funds from the Florida Legislature

Implementing Agencies

- Regional saltwater intrusion management – SFWMD
- FAS Groundwater Model – SFWMD
- Northern Palm Beach County Comprehensive Water Management Plan – City of West Palm Beach, Indian Trail Improvement District and SFWMD
- Eastern Hillsboro Regional ASR Pilot Project – Palm Beach County
- Hillsboro (Site 1) Reservoir Pilot Project – SFWMD
- Lake Worth Lagoon minimum/maximum flow targets – Palm Beach County and SFWMD
- Northern Broward Secondary Canals Recharge Network – Broward County, City of Fort Lauderdale, SFWMD and other local governments
- Southeast Broward County Interconnected Water Supply System – Cities of Hallandale Beach, Hollywood and Dania Beach; Broward County; SFWMD; and the Seminole Tribe
- Broward County urban environmental enhancement – Broward County and SFWMD
- Miami-Dade WASD Utility ASR – Miami-Dade WASD

- Biscayne Bay minimum and maximum flow targets – SFWMD, Miami-Dade County Department of Environmental Resource Management and USACE

Summary of Changes / Implementation from the Previous Work Program

Improve Regional Saltwater Intrusion Management. Improvements to the regional saltwater intrusion management program continued in FY 2003. During FY 2003, a new saltwater intrusion mapping technique utilizing the Internet was developed. This mapping technique taps frequently updated groundwater quality and levels data integrated in its one database, which includes USGS and SFWMD regulatory data. A Broward County cross sectional, density dependent, saltwater intrusion model developed by USGS was peer reviewed.

Floridan Aquifer System Groundwater Model. Documentation of results from the Floridan exploratory well drilling and testing program at five sites in the LEC Planning Area has been completed. This information will be used in development of the Floridan Aquifer System model.

Northern Palm Beach County Comprehensive Water Management Plan. The SFWMD's Governing Board accepted the *Northern Palm Beach County Comprehensive Water Management Plan* (SFWMD, 2002b) in May of 2002. Construction of the G-160, Loxahatchee Slough structure was completed in 2003. The preliminary design of the G-161 culvert under Northlake Boulevard is scheduled for completion during the second quarter of FY 2004. Siting analysis and design for a Control 2 Pump Station to replace the current facility on the M Canal is scheduled for completion in 2004. Widening of the M Canal by the City of West Palm Beach continues to take place.

Eastern Hillsboro Regional ASR Pilot Project. This pilot project is being implemented by the Palm Beach County Water Utilities Department. Construction of the Hillsboro Regional ASR Pilot Project has been completed. Cycle testing will begin upon approval from FDEP.

Hillsboro (Site 1) Reservoir Pilot Project. With the acceleration of the schedule for the CERP Site 1 full-scale impoundment, and the current schedule for the pilot impoundment via the CERP Hillsboro ASR Pilot Project, the necessity for the pilot impoundment was questioned. Accordingly, the USACE/SFWMD management eliminated the pilot impoundment project, as data from the pilot impoundment would not be available in time to aid design for the full-scale impoundment.

Lake Worth Lagoon Minimum/Maximum Flow Targets. The Lake Worth Lagoon Study was conducted to develop a model that will provide a greater understanding of the circulation patterns within the lagoon and predict the response of the system to different quantities and duration of discharges from the major water control structures. District staff has been trained to use the new Lake Worth Lagoon Estuarine Fluid Dynamic Code Hydrodynamic/Salinity model. Palm Beach County staff conducted a more detailed bathymetric survey of the lagoon and the resulting data set was input into the model to

increase its accuracy. The Lake Worth Lagoon minimum and maximum flow targets final project report was completed in May of 2003. The final report has been made available for the CERP consultants to use in the sediment transport component of the CERP North Palm Beach County Project.

Broward County Water Resource Development Projects. The Broward County Water Resource Development Projects (Recommendations 7 and 9 from the LEC Plan) consist of the Northern Broward Secondary Canals Recharge Network and the Broward County Urban Environmental Enhancement. Implementation of these recommendations has been contracted to the Broward County Department of Planning and Environmental Protection. The recommendations have been integrated into the Broward County Countywide Integrated Water Resource Plan. Construction drawings are being prepared for the necessary secondary canal infrastructure including canal interconnections, pumps and storage areas. Work is scheduled to begin at the end of calendar year 2003.

Southeast Broward County Interconnected Water Supply System. Broward County and Hollywood utilities are continuing to discuss increasing the average amount of water the City of Hollywood receives from the County's regional wellfield.

Miami-Dade Water and Sewer Department Utility ASR. Twenty-five MGD of ASR capacity has been constructed, but only 15 MGD of that capacity is allowed for operation. The Miami-Dade WASD is drilling an additional monitoring well and working with the FDEP to obtain an operational permit. The Miami-Dade WASD is currently researching the location of an additional 10 MGD in the vicinity of the Northwest Wellfield.

Biscayne Bay Minimum and Maximum Flow Targets. An initial version of the Biscayne Bay hydrodynamic model has been validated. Improvements are continuing to be made, and will continue as part of the CERP Biscayne Bay Coastal Wetlands Project. The changes being contemplated will be consistent with those needs anticipated for development of minimum flows and levels (MFLs). The USGS groundwater model has been published. The University of Miami completed the ecological model for Biscayne Bay. The completion of these tools will enable scenarios of varying freshwater inflows to be evaluated, resulting in recommendations for a salinity regime for Biscayne Bay.

Other Federal, State or SFWMD Projects

Definition / Discussion

Two groups of projects have been included in this category. The first group (Recommendation 12) includes those Critical Projects in the LEC Planning Area that the SFWMD sponsors locally. The Critical Project Program was authorized by the United States Congress under the Water Resource Development Act of 1996 to expeditiously implement restoration projects that are deemed critical to the restoration of the south Florida ecosystem. The second group (Recommendations 13 through 16) is SFWMD-initiated projects that reflect recommendations developed in the *Caloosahatchee Water Management Plan*

(SFWMD, 2000e) and a recommendation regarding MILs that support similar recommendations in other SFWMD water supply plans.

Recommendations

12. Implement Critical Projects
13. Implement well abandonment programs
14. Investigate saltwater influence at S-79 (Caloosahatchee Basin)
15. Cooperate with other government entities to resolve permitting issues associated with ASR systems and reclaimed water and reuse
16. Maintain and add MILs

Total Costs of Projects / Recommendations

The Critical Projects and the MILs are discussed in the Districtwide Water Resource Development section. The costs for these activities are listed in **Table 2** and **Table 1**, respectively. The SFWMD cost of implementing the remaining recommendations for the five-year period from FY 2004 through FY 2008 is contained in **Table 10**.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

- Critical Projects – SFWMD and state and federal government
- Well abandonment programs – No new sources have been identified; former sources included landowners, local government and water resource development
- Saltwater influence at S-79 – USACE and local governments
- Permitting issues associated with ASR systems and reclaimed water and reuse – SFWMD and FDEP
- Maintain and add MILs – SFWMD, FDEP, USDA, NRCS, Soil and Water Conversation District user fees and utilities

Implementing Agencies

- Critical Projects – SFWMD and USACE
- Well abandonment programs – SFWMD
- Saltwater influence at S-79 – SFWMD
- Permitting issues associated with ASR systems and reclaimed water and reuse – SFWMD, FDEP and USEPA

- Maintain and add MILs – USDA, NRCS, FDACS, FDEP, Soil and Water Conversation District user fees and utilities

Summary of Changes / Implementation from the Previous Work Program

Critical Projects. Manatee barriers and culverts at C-4 and have been installed and the S-9A pump station has been completed. The contract for construction of the S-381 spillway was awarded in September 2003. **Table 2** in the Districtwide Water Resource Development Efforts section summarizes the nonfederal costs of the Critical Projects over the next five fiscal years.

Well Abandonment Program. The Well Abandonment Program was discontinued in 1991. No efforts have been made since then to continue the program for the Caloosahatchee Basin. Well data from the program's former "Data Flex" DOS database are being migrated to the new Well Inventory Lithologic and Geophysical Hydrologic Maintenance Application (WILMA) database, part of the SFWMD's corporate environmental database known as DBHYDRO. The data will include historic information about wells that have been plugged; location coordinates, plugging costs and geophysical logs that have been digitized. Some water quality data values, such as chloride and total dissolved solids, will also be included.

Saltwater Influence at S-79 (Caloosahatchee Basin). Saline water has been a recurring problem for the potable water intakes in the Caloosahatchee River. The potable water intakes are located approximately one mile upstream of the S-79 Structure. During extended periods of low flow, the chloride content of the shallow water increases well beyond the recommended limit of 250 milligrams per liter for drinking water. The SFWMD will coordinate additional analysis of the saltwater influence problem at the S-79 Structure. This recommendation involves staff support and coordination only. This recommendation is linked to the LWC Water Supply Plan Recommendation 7.6. When saltwater intrudes up the Caloosahatchee River to the potable water intakes, releases of water from Lake Okeechobee are made through Structure S-77.

Mobile Irrigation Labs (MILs). In FY 2003, $194,000 was spent in the LEC Planning Area on two MILs: an agricultural lab in Miami-Dade County and an urban lab in Palm Beach County. The MILs have been incorporated into the Comprehensive Water Conservation Program that is discussed in the Districtwide Water Resource Development Efforts section (**Table 1**). An additional urban lab was started in Broward County in FY 2003.

The urban lab educates property owners/operators in irrigation efficiency, system design needs and irrigation scheduling. The urban MIL completed 140 evaluations in FY 2003, with potential water savings of 51 million gallons of water per year and an associated reduction in lawn chemicals and fertilizers leaving the site as runoff. The agricultural labs performed 110 evaluations in FY 2003 with a resulting savings of 265 million gallons of water during the fiscal year.

Comprehensive Everglades Restoration Plan Projects

Definition / Discussion

The keys to Everglades restoration, as determined in the *Central and Southern Florida Project Comprehensive Review Study* (USACE and SFWMD, 1999) (Restudy), are to increase the amount of water available, ensure adequate water quality and reconnect the parts of the system that have interrupted historical drainage patterns. One component of this effort is to annually regain, for beneficial use, about two million acre-feet of excess water that is currently being discharged to tide for flood control. The recommendations made within the Restudy (i.e., structural and operational modifications) are being further refined and will be implemented in the CERP. Analyses completed as part of the LEC Regional Water Supply Plan confirmed that the Restudy projects scheduled for completion by 2020 are extremely beneficial for meeting MFLs and natural system restoration targets. Benefits include reducing high water flows to estuaries and providing water to meet urban and agricultural demands throughout the LEC Planning Area. Many of the proposed projects have significant water resource benefits that need to be considered in this plan.

The CERP is a recommendation of the LEC Regional Water Supply Plan's program of water resource development projects. Completion of CERP projects that affect the LEC and Caloosahatchee Planning Areas by 2020, and timely implementation according to the schedule in the Restudy are crucial to meeting the objectives of the LEC Regional Water Supply Plan. The plan identified 63 CERP projects in the LEC Planning Area. Details of these projects along with estimates of funding requirements can be found in the *Lower East Coast Regional Water Supply Plan*, the *Caloosahatchee Water Management Plan* and the *Central and Southern Florida Project Comprehensive Review Study* (Restudy). Any changes to plan scheduling will be consistent with the five-year update of the LEC Regional Water Supply Plan.

Although the primary purpose of the CERP is to provide environmental restoration for the Everglades, an ancillary benefit is that more water will also be available to meet urban and agricultural needs. Combining associated CERP projects with the LEC Plan was designed to provide sufficient water to meet projected environmental, urban and agricultural water needs in the LEC Planning Area for the next 20 years.

Recommendations

17. Implement CERP projects that affect the LEC Planning Area and the Caloosahatchee Basin

Total Costs of Projects / Recommendations

A listing of individual CERP components in the various SFWMD planning areas and their costs is provided in **Table 3** in the Districtwide Water Resource Development Efforts section.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

The federal government will fund 50 percent of the cost of CERP projects, and the remaining 50 percent will be funded by the SFWMD and the State of Florida. The Miccosukee Indian Tribe, the Seminole Indian Tribe and Miami-Dade County may also provide funding.

Implementing Agencies

The SFWMD, the State of Florida and the USACE will implement the projects. Other local sponsors are also involved, including the Miccosukee Indian Tribe, the Seminole Indian Tribe and Miami-Dade County.

Summary of Changes / Implementation from the Previous Work Program

Implement CERP projects that affect the LEC Planning Area and the Caloosahatchee Basin. Implementation information on CERP projects is available in the *CERP Master Implementation Schedule, Update 1.0* (USACE and SFWMD, 2001). Monthly progress reports for each CERP project are available from http://www.evergladesplan.org.

Recommendations to the CERP from the LEC Regional Water Supply Plan

Definition / Discussion

The LEC Regional Water Supply Plan analyses indicated that refinement of some of the CERP projects might improve their performance. The LEC Regional Water Supply Plan recommends that these modifications be analyzed and incorporated into the planning and design of CERP projects during the project implementation reporting process, into the restoration coordination and verification (RECOVER) process, and into any operational changes for these features.

Recommendations

18. Determine the most effective method to provide water for C-51 backpumping without affecting the location of S-155A
19. Restore or improve hydropatterns within Water Conservation Area (WCA) 2B
20. Conduct more detailed planning and design studies to determine final sizes, depths and configurations of the Everglades Agricultural Area (EAA) Storage Reservoirs

21. Develop an operating schedule for the L-8 Basin Project that can optimize the use of stored ASR water to meet EAA demands
22. Optimize the operation of the C-51 Regional Groundwater Project's ASR features
23. The West Miami-Dade Reuse Feasibility Study should reevaluate the volume of reuse water needed, consider other uses of reclaimed water and analyze alternative sources
24. Implement and periodically update the water supply and environmental (WSE) regulation schedule for Lake Okeechobee
25. Identify seepage barrier locations in the Lake Belt Storage Area Project and coordinate with the mining industry to protect the barriers
26. Develop and implement rain-driven operations for WCAs 2B, 3A, 3B and Everglades National Park by 2005 and for WCA 2A by 2010
27. Change selective coastal wellfield locations and operations as soon as possible

Total Costs of Projects / Recommendations

These analyses, design improvements and changes to management practices may be implemented at minimal cost to the SFWMD, as they will be conducted and incorporated as part of the USACE and the SFWMD detailed design process and the development of project implementation reports for the CERP components. The CERP components are addressed under Recommendation 17 and listed in **Table 3** in the Districtwide Water Resource Development section.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

The SFWMD and the USACE will provide most of the funding for the recommended projects.

Implementing Agencies

The SFWMD and the USACE will implement most of the recommended projects.

Summary of Changes / Implementation from the Previous Work Program

Relocation of S-155A. This analysis will be conducted as part of the CERP North Palm Beach County Project Implementation Report. During 2003, efforts were directed toward preparing the Project Management Plan, which will be approved by the end of 2003.

Restore or improve hydropatterns within WCA 2B. The RECOVER team has not yet made any recommendations that can be implemented in the LEC planning process.

Conduct more detailed planning and design studies to determine final sizes, depths and configurations of the Everglades Agricultural Area (EAA) Storage Reservoirs. The EAA Storage Reservoir CERP Project Management Plan has been approved and the Project Implementation Report (PIR) is currently underway. Analysis will be done during the PIR.

Optimize the use of stored L-8 Basin Project ASR water to meet EAA demands. This analysis will be conducted during the North Palm Beach County CERP Project Part 2 that is scheduled to begin in 2009. During 2003, efforts were directed toward preparing the Project Management Plan for Part 1, the non-ASR components.

Optimize the operation of the C-51 Regional Groundwater Project's ASR features. This analysis will be conducted during the North Palm Beach County CERP Project Part 2 that is scheduled to begin in 2009. During 2003, efforts were directed toward preparing the Project Management Plan for Part 1, the non-ASR components.

The West Miami-Dade Reuse Feasibility Study should reevaluate the volume of reuse water needed, consider other uses of reclaimed water and analyze alternative sources. The CERP Reuse Feasibility Study continued. In July 2003, the Miami-Dade Board of County Commissioners approved a consent decree with FDEP. Important aspects of it include the County's formal commitment to be the local sponsor of the CERP wastewater project and to implement reuse for any additional wastewater disposal associated with expansion of their facilities.

Implementation of the WSE Regulation Schedule for Lake Okeechobee. The SFWMD and the USACE continue to use the WSE schedule adopted in July 2000 to operate Lake Okeechobee.

Identify seepage barrier locations in the Lake Belt Storage Area Project and coordinate with the mining industry to protect the barriers. The CERP Lake Belt Pilot Project began in 2002 to provide information for the full CERP Lake Belt Storage Project that is scheduled to start in 2011. The tentative location for the pilot project has been identified.

Everglades Rain-Driven Operations. During FY 2003, the contractor continued to develop rainfall-driven operations for WCA 3 and Everglades National Park based upon the statement of work that had been developed and approved by the SFWMD and Everglades National Park staff.

Change Coastal Wellfield Operations. The identified utilities are evaluated for alternate wellfield locations and operation schedules as part of the consumptive use permitting process. This occurs on a continual basis.

The LEC Plan recommended that some cities in Palm Beach County shift future demand westward. To date, Boca Raton, Lantana and Riviera Beach have accomplished the shift westward.

Recommendations to the CERP from the Caloosahatchee Water Management Plan

Definition / Discussion

The modeling conducted as part of the *Caloosahatchee Water Management Plan* (SFWMD, 2000e) and incorporated into the LEC Regional Water Supply Plan used revised Caloosahatchee Basin hydrology and demands from those used in the Restudy. This assessment showed higher demands and lower runoff from the basin, and consequently less water was available to be backpumped into Lake Okeechobee for storage. The Caloosahatchee Water Management Plan identified the need for additional storage within the basin using a regional optimization approach. It was determined that underground storage (ASR systems) must be able to tolerate extended withdrawals of 220 MGD and that at least 220,000 acre-feet of aboveground storage (reservoirs plus other storage options) were needed.

Recommendations

28. Develop a Caloosahatchee River ASR pilot project
29. Implement the C-43 Storage Project
30. Complete the Southwest Florida Study

Total Costs of Projects / Recommendations

These projects have been incorporated into the CERP. Costs are listed in **Table 3**.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

The SFWMD and the USACE will provide most of the funding for the recommended projects.

Implementing Agencies

The SFWMD and the USACE will implement the recommended projects.

Summary of Changes / Implementation from the Previous Work Program

The summaries for these three recommendations are discussed in the Surface Water (water source option 7) subsection in the LWC section of this work plan.

Operational Recommendations

Definition / Discussion

Changes in the operation of the Central and Southern Florida Project are needed to accommodate the future construction of proposed major water resource development features. Revised systemwide operational protocols will also be required to assure that projected water supply plan performance targets are met and expected benefits are achieved. A process to periodically review and recommend potential short-term deviations to the systemwide operational protocols is needed. This process must consider variations in weather and hydrologic conditions, and identify opportunities for short-term operational deviations that will offset, to some extent, possible impacts of such events. Some measure of operational flexibility is needed that incorporates public input and the SFWMD's Governing Board approval prior to implementation. Changes must be consistent with the requirement of existing and legal reservations contained in the Water Resource Development Act (WRDA) of 2000.

Recommendations

31. Develop systemwide operational protocols and a periodic operational deviation process
32. Develop periodic operational flexibility
33. Develop a Lake Okeechobee vegetation management plan

Total Costs of Projects / Recommendations

The cost to the SFWMD of implementing these recommendations for the five-year period from FY 2004 through FY 2008 is contained in **Table 10**.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

The SFWMD, the USACE and the FDEP will fund operational protocols and flexibility. The SFWMD, the FDEP and the USACE are funding the development of a Lake Okeechobee vegetation management plan. Funding for vegetation management will also be coordinated with the State of Florida's fire permitting agency (Division of Forestry, FDACS).

Implementing Agencies

Operational protocols and flexibility will be implemented by the SFWMD. The SFWMD, the FDEP and the USACE will implement Lake Okeechobee vegetation management.

Summary of Changes / Implementation from the Previous Work Program

Develop operational protocols and flexibility. In 2002, the SFWMD Governing Board accepted the *Adaptive Protocols for Lake Okeechobee Operations* in cooperation with the USACE and the FDEP, and these protocols have been used since that time. Adaptive protocols for other areas may be limited due to concerns about the "savings clause" contained in the Water Resources Development Act of 2000.

Lake Okeechobee Vegetation Management Plan. A Melaleuca and Brazilian Pepper Control Program was conducted by ground and aerial application techniques to effectively contain and progressively reduce exotic plant populations within Lake Okeechobee's littoral zone. The program consisted primarily of a ground-based herbicide application, with some aerial application within the western littoral area. Ground crews completed melaleuca, Brazilian pepper and Australian pine treatment along the eastern side of Lake Okeechobee, from the Port Mayaca lock to the City of Belle Glade.

The USACE continues to manage the traditional aquatic weed treatment program in Lake Okeechobee, spending approximately $600,000 to $800,000 annually. The USACE maintains an Interagency *Lake Okeechobee Vegetation Management Plan* that defines agreed upon methods for vegetation management on the lake.

Consumptive Use Permitting and Resource Protection Projects

Definition / Discussion

Implementation of the LEC Regional Water Supply Plan through consumptive use permitting (CUP) and resource protection actions will take place consistent with Florida law. Implementation will utilize the water users' assurances framework developed by the Governor's Commission for a Sustainable South Florida, included in the CERP, and further defined through WRDA 2000. Rulemaking to implement the regulatory recommendations of the plan will constitute a significant effort during the next several years. Rulemaking will include water reservations and numerous CUP criteria, some of which are interrelated and cumulatively define the availability of water for consumptive uses and water resource protection. It was recommended in the 2000 LEC Regional Water Supply Plan that certain rulemaking efforts be grouped in phases to allow for cumulative analysis of their water resource and consumptive use implications.

Another goal of the rulemaking schedule is to adopt rules as the technical information becomes available. Initial rulemaking has proceeded for concepts that have been sufficiently identified and evaluated, such as establishment of MFLs for the Everglades, Lake

Okeechobee, the Biscayne Aquifer and the Caloosahatchee River. These were established in September 2000.

Recommendations

34. Implement water reservations
35. Establish Biscayne Bay, Florida Bay, St. Lucie Estuary and the southern coastal Biscayne Aquifer MFLs
36. Develop and implement MFL criteria for the Rockland Marl Marsh
37. Establish MFLs for Florida Bay
38. Develop and implement MFL recovery strategies
39. Establish MFL Monitoring Systems
40. Implement CUP, rulemaking and resource protection projects

Total Costs of Projects / Recommendations

The SFWMD cost of implementing these recommendations for the five-year period from FY 2004 through FY 2008 is contained in **Table 10**.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

Funding for all of the CUP and resource protection projects will be provided by the SFWMD.

Implementing Agencies

The SFWMD will establish a water resources policy consistent with the WRDA 2000 and will implement water reservations and CUP rulemaking projects. It will also establish MFLs and recovery strategies and perform associated monitoring. The SFWMD and Everglades National Park will develop MFLs for Florida Bay.

Summary of Changes / Implementation from the Previous Work Program

Water Reservations. The planning process for developing water reservations is being developed in partnership between the USACE, the SFWMD, other agencies and the public. Concepts and methodologies presented in the April 25, 2003 final draft white paper titled, *Water Resource Protection Strategies for the Implementation of CERP Under Federal and State Law* were accepted by the Governing Board at the June 2003 Workshop. These concepts will be used in development of the CERP Guidance Memoranda involving quantification of water made available by the CERP and water reserved for the natural system. Meetings were held in 2003 with representatives from the USACE, FDEP and other

interested parties/agencies to develop the process for drafting the CERP Guidance Memoranda that are required by the Programmatic Regulations for the CERP. Once the process and outline for the memoranda are developed, the SFWMD will assist USACE in drafting the CERP Guidance Memorandum for quantification of water made available and water to be reserved for the natural system as CERP projects are implemented.

Establish MFLs for Priority Water Bodies and Monitor for Compliance. Recommendations 35 through 39 require the establishment of MFL criteria, development and implementation of recovery strategies and the establishment of a system for monitoring MFLs. MFLs have been adopted for the Everglades, Lake Okeechobee and the Biscayne Aquifer, the Caloosahatchee River and Estuary and the St. Lucie River and Estuary. The SFWMD Governing Board adopted MFLs for the Northwest Fork of the Loxahatchee River in February 2003. Each MFL technical document includes a MFL recovery plan that provides a description of the programs, projects and schedules that will meet the MFL.

Monitoring efforts are underway in those water bodies that have established MFLs. A monitoring plan has also been recently initiated for the N.W. fork of the Loxahatchee River.

Research efforts are continuing in Florida Bay and Biscayne Bay to investigate the effects of freshwater flow on estuarine and marine resources to provide the basis to establish MFLs for these estuaries. A modeling study is underway to support the development of MFL technical criteria for the southern Biscayne Aquifer.

CUP, Rulemaking and Resource Protection Projects. The staffing requirements for the CUP, rulemaking and resource protection projects recommended in all of the regional water supply plans have been incorporated into Recommendation 40 in **Table 10**, since most of the permitting, rulemaking and resource protection issues originate in the LEC Planning Area. The SFWMD has initiated numerous rulemaking efforts consistent with the regional water supply plans. The initial proposed rules, which became known as the “A List” rules, were effective in August 2002.

The “B List” consumptive use permitting rules were adopted in June 2003 and became effective in September 2003. Consensus on the wording of the rules was developed through stakeholder workshops with the Water Resources Advisory Commission. The rules address numerous issues, including permit duration, supplemental irrigation requirements, pollution remediation, interference with existing legal uses, existing offsite land use impacts, pasture irrigation, reuse of reclaimed water, wellfield operational plans, diversion and impoundment permits, permit renewal process, impact evaluations, local sources first, aquifer storage and recovery, wetland protection, areas with maximum developable limits, fees and other review criteria and limiting conditions.

Other Water Resource Projects

Definition / Discussion

The final group of water resource development projects recommended in the LEC Regional Water Supply Plan is included in "Other Water Resource Projects." This category contains five recommendations that did not fit into the other seven groups. One recommendation is to develop a Districtwide Comprehensive Water Conservation Program, which was also recommended in the other regional water supply plans. The remaining recommendations are for evaluation and feasibility projects identified during the LEC regional water supply and integrated water management planning and development processes. These feasibility projects will be completed and used in the formulation of the next update of the plan, to be completed by 2005.

Recommendations

41. Develop a comprehensive water conservation program
42. Conduct a seawater reverse osmosis treatment facilities feasibility study
43. Conduct a feasibility study for a reclaimed water system in northern Palm Beach County
44. Conduct an indirect aquifer recharge feasibility study
45. Conduct an evaluation of high volume surface water ASR testing in Taylor Creek

Total Costs of Projects / Recommendations

The costs of developing the Comprehensive Water Conservation Program are discussed in the Districtwide Water Resource Development Efforts section (**Table 1**). The evaluation of high volume surface water ASR testing in Taylor Creek has been incorporated into the CERP ASR pilot projects listed in **Table 3**. The SFWMD cost of implementing the remaining recommendations for the five-year period from FY 2004 through FY 2008 is contained in **Table 10**.

Quantity of Water Potentially Available

See **Table 11** for the quantity of water potentially available in FY 2004 and by FY 2008.

Funding Sources

Funding for the Comprehensive Water Conservation Program, the Reverse Osmosis Treatment Feasibility Study and the Evaluation of Aquifer Storage and Recovery in Taylor Creek will be provided by the SFWMD. The SFWMD, water users and local utilities will fund the feasibility study for a Northern Palm Beach County Reclaimed Water System. Funding for the Indirect Aquifer Recharge Project may be obtained from the SFWMD, counties or local utilities.

Implementing Agencies

Most of these projects will be implemented by the SFWMD. Interested public water utilities may also participate in reverse osmosis projects. The FDEP, the SFWMD, counties or local utilities may participate in implementation of an indirect aquifer recharge project.

Summary of Changes / Implementation from the Previous Work Program

Comprehensive Water Conservation Program. The Water Conservation Section, created in FY 2002 in the SFWMD Water Supply Department, coordinates and manages several water supply and demand management programs, including Mobile Irrigation Labs (MILs), Water Reuse, the Alternative Water Supply Grant Program, Water Saving Incentive Grant Program and Outreach and Education. The MILs in the LEC Planning Area performed 250 evaluations in 2003 and are discussed under Recommendation 16. The Districtwide Comprehensive Water Conservation Program is using guidance from the Florida Water Conservation Initiative (FDEP 2002) to implement water conservation programs throughout the SFWMD. This is discussed more extensively in the Districtwide Water Resource Development Efforts section of this document.

Seawater Reverse Osmosis Treatment Facilities. The Seawater Reverse Osmosis Treatment Facility Feasibility Study was completed in May 2002. Two sites, Fort Myers in Lee County and Port Everglades in Broward County, were considered highly desirable and technically feasible. These sites were recommended for more detailed evaluation and cost analysis. The Fort Myers site was considered more feasible and initial efforts have been directed toward this facility. SFWMD, Lee County utilities and Florida Power & Light are currently negotiating a Memorandum of Agreement.

Based on the study, the capital cost of the colocated facility at Fort Myers would be $17.3 million, yielding a unit cost of $1.33 per 1,000 gallons for a 10-MGD facility. The capital cost of the 25-MGD facility would be $35.5 million, yielding a unit cost of $1.16 per 1,000 gallons.

Reclaimed Water System in Northern Palm Beach County. The study was completed in December 2002 and concluded that a regional system to provide reclaimed water to users in northern Palm Beach and southern Martin Counties was not cost-effective. Rather than a regional reclaimed water system, the study recommended that the existing utilities be responsible for developing a reclaimed water system within their service areas.

Indirect Aquifer Recharge. District staff met with the FDEP Secretary and others and agreed to form a partnership to explore the Indirect Aquifer Recharge concept. Several meetings have been held between staff from the SFWMD and FDEP to work on an agreeable process and approach; however, agreement has not yet been reached. The FDEP and the SFWMD will continue working together to determine a process and approach to further explore Indirect Aquifer Recharge.

High Volume Surface Water ASR Testing in Taylor Creek. The testing of high volume surface water ASR in Taylor Creek is currently not feasible. The testing has been incorporated into the CERP ASR pilot projects for further evaluation.

Summary of LEC Regional Water Supply Plan Costs and Schedules

Table 10. Summary of Estimated Schedule and SFWMD Costs for Water Resource Development Recommendations in the LEC Regional Water Supply Plan

Water Source Options and Recommendations		Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon LEC Plan Update in 2005											
		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–08	
		$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
Ongoing Projects from the LEC Interim Plan													
1	Improve regional saltwater intrusion management	133	0.30	163.5	0.30	163.5	0.30	163.5	0.30	163.5	0.30	787	1.50
2	Refine the FAS Groundwater Model	160	0.40	99.5	0.40	99.5	0.40	99.5	0.40	99.5	0.40	558	2.00
3	Develop a northern Palm Beach County comprehensive water management plan	See CERP subsection (**Table 3**) of the Districtwide Water Resource Development Efforts section											
4	Construct and operate the Eastern Hillsboro Regional ASR Pilot Project	SFWMD funding completed											
5	Construct and operate the Hillsboro (Site 1) Reservoir Pilot Project	See CERP subsection (**Table 3**) of the Districtwide Water Resource Development Efforts section											
6	Establish Lake Worth Lagoon minimum/maximum flow targets	Complete											
7-9	Implement the Broward County water resource development projects	75	0.20	500	0.20	Complete						575	0.40
10	Construct the Miami-Dade WASD Utility ASR	300	0.00	1,500	0.00	1,500	0.00	1,500	0.00	1,500	0.00	6,300	0.00
11	Establish Biscayne Bay minimum and maximum flow targets	See Recommendations 34 through 40											
	Subtotal	**668**	**0.90**	**2,263**	**0.90**	**1,763**	**0.70**	**1,763**	**0.70**	**1,763**	**0.70**	**8,220**	**3.90**
Other Federal, State or SFWMD Projects													
12	Implement Critical Projects	See the Districtwide Water Resource Development Efforts section (**Table 2**)											
13	Implement well abandonment programs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
14	Investigate saltwater influence at S-79	See Summary of LWC Water Supply Plan Costs and Schedules (**Table 8, 2.1.1**)											
15	Permitting issues associated with ASR systems and reclaimed water and reuse	0	1.00	0	1.00	0	1.00	0	1.00	0	1.00	0	5.00
16	Maintain and add MILs	See the Districtwide Water Resource Development Efforts section (**Table 1**)											
	Subtotal	**0**	**1.00**	**0**	**1.00**	**0**	**1.00**	**0**	**1.00**	**0**	**1.00**	**0**	**5.00**
Comprehensive Everglades Restoration Plan Projects													
17	Implement CERP projects that affect the LEC Planning Area and the Caloosahatchee Basin	See CERP subsection (**Table 3**) of the Districtwide Water Resource Development Efforts section											
Recommendations to the CERP from the LEC Regional Water Supply Plan													
18	C-51 backpumping/location of S-155A	No additional costs beyond those listed under CERP (**Table 3**) in the Districtwide Water Resource Development Effort section											
19	Restore or improve hydropatterns within WCA-2B												
20	EAA Storage Reservoirs design study												
21	L-8 Basin Project operating schedule												

Table 10. Summary of Estimated Schedule and SFWMD Costs for Water Resource Development Recommendations in the LEC Regional Water Supply Plan (Continued)

Water Source Options and Recommendations		Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon LEC Plan Update in 2005											
		FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–08	
		$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
22	C-51 Regional Groundwater Project's ASR	No additional costs beyond those listed under CERP (**Table 3**) in the Districtwide Water Resource Development Effort section											
23	West Miami-Dade Reuse Feasibility Study												
24	Implement and update the WSE regulation schedule for Lake Okeechobee												
25	Lake Belt Storage Area Project seepage barrier protection												
26	Develop and implement rain-driven operations												
27	Change coastal wellfield operations	No additional costs beyond permitting staffing											
Recommendations to the CERP from the Caloosahatchee Water Management Plan													
28	Develop a Caloosahatchee River ASR pilot project	See CERP subsection (**Table 3**) of the Districtwide Water Resource Development Efforts section											
29	Implement the C-43 Storage Project												
30	Complete the Southwest Florida Study												
Operational Recommendations													
31	Develop systemwide operational protocols and a periodic operational deviation process	0	1.00	0	1.00	0	1.00	0	1.00	0	1.00	0	5.00
32	Develop periodic operational flexibility	0	1.00	0	1.00	0	1.00	0	1.00	0	1.00	0	5.00
33	Develop a Lake Okeechobee vegetation management plan	760	0.20	150	0.20	150	0.20	150	0.20	150	0.20	1,360	1.00
	Subtotal	**760**	**2.20**	**150**	**2.20**	**150**	**2.20**	**150**	**2.20**	**150**	**2.20**	**1,360**	**11.00**
Consumptive Use Permitting and Resource Protection Projects													
34	Implement water reservations	0	4.00	0	4.00	0	4.00	0	4.00	0	4.00	0	20.00
35-39	Establish MFLs for priority water bodies and monitor for compliance	200	5.00	200	5.00	200	5.00	200	5.00	200	5.00	1,000	25.00
40	Implement CUP, rulemaking and resource protection projects	0	5.00	0	5.00	0	5.00	0	5.00	0	5.00	0	25.00
	Subtotal	**200**	**14.00**	**200**	**14.00**	**200**	**14.00**	**200**	**14.00**	**200**	**14.00**	**1,000**	**70.00**
Other Water Resource Projects													
41	Develop a comprehensive water conservation program	See the Districtwide Water Resource Development Efforts section (**Table 1**)											
42	Conduct a seawater reverse osmosis treatment facilities feasibility study	500	0.40	100	0.40	100	0.40	100	0.40	100	0.40	900	2.00
43	Develop a reclaimed water system in northern Palm Beach County	Completed											
44	Conduct an indirect aquifer recharge feasibility study	0	0.0	250	0.50	250	0.50	250	0.50	250	0.50	1,000	2.00
45	Conduct an evaluation of high volume surface water ASR testing in Taylor Creek	Incorporated into the ASR pilot projects for further evaluation listed under CERP (**Table 3**)											
	Subtotal	**500**	**0.40**	**350**	**0.90**	**350**	**0.90**	**350**	**0.90**	**350**	**0.90**	**1,900**	**4.00**

Water Source Options and Recommendations	Plan Implementation Costs ($1,000s and FTEs) Funding after FY 2005 dependant upon LEC Plan Update in 2005											
	FY 2004		FY 2005		FY 2006		FY 2007		FY 2008		Total Cost FY 2004–08	
	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE	$	FTE
TOTAL	**2,128**	**18.50**	**2,963**	**19.00**	**2,463**	**18.80**	**2,463**	**18.80**	**2,463**	**18.80**	**12,480**	**93.90**

Summary of the Quantity of Water to Be Made Available by Implementation of the LEC Regional Water Supply Plan

Table 11. Water Made Available Through Implementation of the LEC Regional Water Supply Plan in FY 2004 and by FY 2008

Recommendation		Est. Water Made Available (MGD)	
		In FY2004	By FY2008
	Ongoing Projects from the LEC Interim Plan		
1	Regional Saltwater Intrusion Management	0.00	0.00
2	FAS Groundwater Model	0.00	0.00
3	Northern Palm Beach County Comprehensive Water Management Plan	0.00	0.00
4	Eastern Hillsboro Regional ASR Pilot Project	0.00	5.00
5	Hillsboro (Site 1) Impoundment Pilot Project	0.00	0.00
6	Lake Worth Lagoon Minimum/Maximum Flow Targets	0.00	0.00
7	Northern Broward County Secondary Canals Recharge Network	0.00	0.00
8	Southeast Broward County Interconnected Water Supply System	0.00	0.00
9	Broward County Urban Environmental Enhancement	0.00	0.00
10	Miami-Dade Water and Sewer Department Utility ASR Project	15.00	35.00
11	Biscayne Bay Minimum/Maximum Flow Targets	0.00	0.00
	Other Federal, State or SFWMD Projects		
12	Critical Projects	0.00	61.00
13	Well Abandonment Program (from CWMP)	0.00	0.00
14	Saltwater Influence at S-79 (from CWMP)	0.00	0.00
15	Permitting Issues Associated with ASR Systems and Reuse of Reclaimed Water	0.00	0.00
16	Mobile Irrigation Labs	1.20	6.00
17	**CERP Projects**		
	Recommendations to the CERP from the LEC Plan and CWMP		
18	S-155A	0.00	0.00
19	Everglades Hydropatterns within WCA-3-B	0.00	0.00
20	Everglades Agricultural Area Storage Reservoirs	0.00	0.00
21	L-8 Project	0.00	0.00
22	C-51 Regional Groundwater Projects ASR Facilities	0.00	0.00
23	West Miami-Dade Reuse Feasibility	0.00	0.00
24	Lake Okeechobee Regulation Schedule	0.00	0.00
25	Lake Belt Storage Area Projects	0.00	0.00
26	Everglades Rain-Driven Operations	0.00	0.00
27	Change Coastal Wellfield Operations	0.00	0.00
28	Caloosahatchee River ASR Pilot Project	0.00	0.00
29	C-43 Basin Storage Reservoir and ASR Project	0.00	0.00
30	Southwest Florida Study	0.00	0.00
	Operational Projects		
31	Systemwide Operational Protocols	0.00	0.00
32	Periodic Operational Flexibility	0.00	0.00
33	Lake Okeechobee Vegetation Management Plan	0.00	0.00
	Consumptive Use Permitting and Resource Protection Projects		
34	Water Reservations	0.00	0.00
35	Establish MFLs	0.00	0.00
36	MFL Criteria for Rockland Marl Marsh	0.00	0.00
37	MFLs for Florida Bay	0.00	0.00
38	MFL Recovery Strategies	0.00	0.00
39	MFL Monitoring Systems	0.00	0.00
40	Consumptive Use Permitting, Rulemaking and Resource Protection Projects	0.00	0.00
	Other Projects		
41	Comprehensive Water Conservation Program	17.30	47.70
42	Seawater Reverse Osmosis Treatment Facilities	0.00	0.00
43	Reclaimed Water System in Northern Palm Beach County	0.00	0.00
44	Indirect Aquifer Recharge	0.00	0.00
45	High Volume Surface Water ASR Testing in Taylor Creek	0.00	0.00
	TOTAL	**33.50**	**154.70**

REGIONAL WATER SUPPLY PLAN COSTS

The following table (**Table 12**) summarizes each of the regional water supply plan estimated costs for FY 2004 through FY 2008 and provides a total estimated cost for all the water supply planning areas for FY 2004 through FY 2008.

Summary of Regional Water Supply Plan Costs

Table 12. Regional non-FTEs Water Resource Department Costs FY 2004 – FY 2008

Region	Plan Implementation Costs ($1,000s)					
	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	Total FY 2004 - 2008
Kissimmee Basin	232	375	0	0	0	607
Upper East Coast	134	125	125	125	125	634
Lower West Coast	740	925	890	1,590	2,090	6,235
Lower East Coast	2,128	2,963	2,463	2,463	2,463	12,480
Total	**3,234**	**4,388**	**3,478**	**4,178**	**4,678**	**19,956**

The SFWMD has 23 budgetary programs. Through the Water Management Planning and Implementation Program (Program D), the SFWMD develops and implements regional water supply plans and establishes minimum flows and levels for surface and groundwater systems. Regional water supply plans balance water needs of the environment with the demands of urban and agricultural users and reflect a 20-year planning horizon. Water resource development projects outlined in the regional water supply plans are primarily implemented through Program D, as well as through CERP (Program P). The SFWMD primarily funds water resource development projects, which are projects that are regional in scope and supplement water resources. Utilities and local governments primarily fund water supply development projects that serve the specific utility or municipality and supply water to their customers. In FY 2003, the SFWMD spent $9,438,779 and encumbered $13,429,342 for contracts in Program D. This does not include SFWMD staff costs.

Through the planning and implementation process, Program D activities are coordinated with the Comprehensive Everglades Restoration Plan (Program P) and among other SFWMD programs. The CERP is a framework and guide to restore, protect and preserve the water resources of central and southern Florida, including the Everglades. Principal features of the plan are the creation of approximately 217,000 acres of new reservoirs and wetlands-based water treatment areas. These features vastly increase storage and water supply for the natural systems, as well as for urban and agricultural needs, while maintaining current Central and Southern Florida Flood Control Project purposes. In FY 2003, the SFWMD spent $166,453,538 and encumbered $70,972,589 through Program P. This does not include SFWMD staff costs.

FUNDING NEEDS

From FY 2004 through FY 2008, it is estimated that the implementation of the regional water supply plans (including Districtwide projects) and the CERP will cost the SFWMD $1,217.4 million. The projected cost is distributed as follows:

- Districtwide non-CERP projects – $6.9 million with 35.00 FTEs
- Nonfederally funded CERP Projects, including Critical Projects – $1,190.6 million*
- KB Water Supply Plan – $0.6 million with 18.00 FTEs
- UEC Water Supply Plan – $0.6 million with 2.00 FTEs
- LWC Water Supply Plan – $6.2 million and 11.05 FTEs
- LEC Regional Water Supply Plan – $12.5 million with 93.90 FTEs

For the current fiscal year, FY 2004, the total SFWMD budget for water resource development projects and the CERP is $296.9 million. The cost is distributed as follows:

- Districtwide non-CERP projects – $1.3 million and 7.00 FTEs
- Nonfederally funded CERP projects, including Critical Projects – $292.5 million*
- KB Water Supply Plan – $0.2 million with 7.80 FTEs
- UEC Water Supply Plan – $0.1 million 0.40 FTEs
- LWC Water Supply Plan – $0.7 million with 2.25 FTEs
- LEC Regional Water Supply Plan – $2.1 million with 18.50 FTEs

The costs do not include SFWMD staff costs except in the CERP and Critical Projects. The time frames for implementation of the water supply plans vary. Some plans with few capital projects may be implemented fairly quickly. Other plans, such as the LEC Regional Water Supply Plan, have many large capital projects and will take longer.

While the SFWMD will move forward with implementing the plans, timing could change based on available funding for FY 2005 through FY 2008, and the specific projects could be refined or changed based on preliminary feasibility studies or results of pilot projects. As mentioned in the Introduction, costs of implementation for FY 2004 correspond with the adopted budget for that year, and may be different from estimates in the actual plans.

*** Costs for the CERP and Critical Projects include FTEs**

SOURCES OF FUNDING

The SFWMD is under statutory requirement to implement the regional water supply plans (Section 373.0361, F.S.), yet the SFWMD's budget is a limiting factor. The SFWMD uses funds from ad valorem sources, as well as federal and state grants to fund water resource development projects. Local sponsors are being sought, and projects with local cost share or sponsorship will be prioritized.

REFERENCES

FDEP. 2002. *Florida Water Conservation Initiative Final Report*. Florida Department of Environmental Protection, Tallahassee, FL.

Pyne. 1995. *Groundwater Recharge and Wells: A Guide to Aquifer Storage Recovery*. CRC, Boca Raton, FL.

SFWMD. 1994. *Lower West Coast Water Supply Plan*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 1998a. *Upper East Coast Water Supply Plan*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 1998b. *Interim Plan for Lower East Coast Regional Water Supply*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 1999. *Five-Year Water Resource Development Work Program: Fiscal Years 2000–2004*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2000a. *Five-Year Water Resource Development Work Program: Fiscal Years 2001–2005*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2000b. *Kissimmee Basin Water Supply Plan*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2000c. *Lower West Coast Water Supply Plan*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2000d. *Lower East Coast Regional Water Supply Plan*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2000e. *Caloosahatchee Water Management Plan*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2000f. *District Water Management Plan*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2002a. *Five-Year Water Resource Development Work Program: Fiscal Years 2002–2006*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2002b. *Northern Palm Beach County Comprehensive Water Management Plan: Planning Document*. South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2003. *Five-Year Water Resource Development Work Program: Fiscal Years 2003–2007*. South Florida Water Management District, West Palm Beach, FL.

USACE and SFWMD. 1999. *Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement* (Restudy). United States Army Corps of Engineers, Jacksonville District, Jacksonville, FL and South Florida Water Management District, West Palm Beach, FL.

USACE and SFWMD. 2000. *Master Program Management Plan*. United States Army Corps of Engineers, Jacksonville, FL. and South Florida Water Management District, West Palm Beach, FL.

USACE and SFWMD. 2001. *CERP Master Implementation Schedule, Update 1.0*. United States Army Corps of Engineers, Jacksonville, FL. and South Florida Water Management District, West Palm Beach, FL.

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